June 18, 1986

STATE DEPARTMENT OF HIGHWAYS
DIVISION OF HIGHWAYS - STATE OF COLORADO
SPECIAL PROVISIONS
COLORADO PROJECT NO. IR 25-2(187)
6TH AVENUE RAMPS F AND C

The following Special Provisions take precedence over Standard Specifications, Supplemental Specifications and Plans, and modify or supplement the Standard Specifications for Road and Bridge Construction, dated 1981, which is used to control construction of this project.

REQUIRED PROVISIONS ON FEDERAL-AID CONTRACTS - Form PR-1273 Rev. 9/75 and Addendum.

REQUIRED ON ALL CONTRACTS - Supplemental Specifications, dated October 1, 1984.

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June 18, 1986

STATE DEPARTMENT OF HIGHWAYS
DIVISION OF HIGHWAYS - STATE OF COLORADO
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FOR RELEASE WEDNESDAY
December 18, 1985

DOT 134-85
Contact: Jennifer Hillings
Tel.: (202) 426-4570
Ted Lopatkiewicz
Tel.: (202) 426-0398

DOT "HOTLINE" TO RECEIVE INFORMATION
ABOUT DISADVANTAGED BUSINESS FRAUDS

Joseph P. Welsch, Inspector General for the Department of Transportation, today said that in conjunction with the Department of Justice, special emphasis is being placed on the investigation of abuses in the Disadvantaged Business Enterprise Program.

The action resulted from Secretary of Transportation Elizabeth Hanford Dole's announcement that she was directing the Inspector General to "mount an offensive against minority fronts with the same determination and vigor that have assured our success in efforts against bid-rigging."

Dole told the National Minority Supplier Development Council recently that she expects significant results in the investigation and prosecution of minority fronts.

Figures show disadvantaged businesses in fiscal year 1985 received over $1.7 billion from federally funded projects of the Federal Highway and Urban Mass Transportation Administrations. Welsch said these agencies, which dispense the grants, are actively supporting the investigation. He said the investigation will be directed toward prosecuting non-disadvantaged prime contractors who are abusing the program, which is directed at assuring disadvantaged business enterprises' share in the contracting of projects.

"Some schemes involve the voluntary participation of minority 'fronts,' while some involve participation by legitimate disadvantaged businesses who are used as 'brokers' for 'pass through' subcontracts to non-disadvantaged firms," Welsch said. "Others use the name of disadvantaged businesses without their knowledge or consent. The number of schemes and variations is limited only by the ingenuity of the perpetrator."

The DOT Inspector General (IG) said criminal violations have included false statements, false claims, perjury, mail fraud, wire fraud, conspiracy, antitrust violations, extortion, and others. "Because of the potential for abuses in this multi-billion dollar program, the Fraud Section of the Criminal Division, Department of Justice, is taking measures to insure that all substantive criminal violations receive full prosecutive consideration," he said.

-more-

"Federal funds available through grant programs should be used to accomplish the intended goals of the program," Welsch declared. "Any indication of fraud, waste, abuse, or mismanagement of these funds should immediately be reported to the appropriate officials in the state or local government or to the Office of Inspector General, U.S. Department of Transportation."

Welsch asked that anyone with knowledge of fraud in the Disadvantaged Business Enterprise Program call the IG's toll-free Hotline at 800-424-9071, or any of the field offices listed below, to report it. The Hotline is manned during normal working hours from 8 a.m. to 4:30 p.m. (EST). For persons in the Washington metropolitan area the number is 755-1855 or 755-1856. Callers may be anonymous and may request that their identity be protected; Government employees are protected from reprisals.

CALL	WRITE
Inspector General's Hotline Toll Free 800-424-9071 Washington, D.C. Area 755-1855/56	Inspector General Post Office Box 23178 L'Enfant Plaza Station Washington, D.C. 20024-0178

Field office addresses and telephone numbers attached:

OFFICE	GEOGRAPHICAL AREAS
Office of Washington Operations	
Special Agent-in-Charge FTS: 8-426-0681 Comm: 202-426-0681 400 Seventh St., S.W., Room 7422 Washington, D.C. 20590	District of Columbia Maryland counties contiguous to D.C. Virginia West Virginia
Baltimore Regional Office	
Special Agent-in-Charge FTS: 8-922-6175 Comm: 301-962-6175 31 Hopkins Plaza, Room 1022 Baltimore, Maryland 21201	Connecticut, New Jersey Delaware, New York Maryland (less counties contiguous to Washington, D.C.) Massachusetts, Rhode Island New Hampshire, Vermont
Atlanta Regional Office	
Special Agent-in-Charge FTS: 8-257-7836 Comm: 404-881-7836 1718 Peachtree Rd. NW, Suite 397 Atlanta, Georgia 30309	Alabama, Tennessee Florida, North Carolina Georgia, South Carolina Kentucky, Puerto Rico
Chicago Regional Office	
Special Agent-in-Charge FTS: 8-353-0106 Comm: 312-353-0106 165 N. Canal St., Suite 1400S-B Chicago, Illinois 60606	Illinois, Missouri Indiana, Ohio Iowa, North Dakota Michigan, South Dakota Minnesota, Wisconsin
Fort Worth Regional Office	
Special Agent-in-Charge FTS: 8-334-2911 Comm: 817-334-2911 819 Taylor Street, Room 9A27 Fort Worth, Texas 76102	Arkansas, New Mexico Colorado, Oklahoma Kansas, Texas
San Francisco Regional Office	
Special Agent-in-Charge FTS: 8-454-9875 Comm: 415-974-9875 211 Main Street, Suite 1022 San Francisco, California 94105	Alaska, Montana Arizona, Nevada California, Oregon Hawaii, Washington Idaho, U.S. Possessions-Pacific

April 10, 1986

NOTICE TO BIDDERS

COLORADO PROJECT NO. IR 25-2(187)

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

It is recommended that bidders on this project go over the plan details with one of the following field representatives of the Division:

Resident Engineer: G.R. Self
Golden,Colorado
Office Phone: 279-5841

Prospective bidders shall contact the above engineer at least 12 hours in advance of the time they wish to go over the project in order that the engineer may efficiently schedule his work.

April 10, 1986

COMMENCEMENT AND COMPLETION OF WORK
COLORADO PROJECT NO. IR 25-2(187)

The Contractor shall commence work under his contract on or before the 20th day following the date of award unless such time for beginning the work is changed by the Chief Engineer in the "Notice to Proceed". The Contractor shall complete all work within 240 working days in accordance with the "Notice to Proceed".

Salient features to be shown on the Contractor's Progress schedule are:

1. Detours
2. Earthwork
3. Piling
4. Piers
5. Abutments
6. Box Girders
7. Bridge Deck
8. Prestressing
9. Closure Pour
10. Paving
11. Ramp C
12. Retaining Walls
13. Sprinkler System
14. Landscaping

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

In Subsection 108.06, delete the eighth paragraph.

CONTRACT GOALS

COLORADO PROJECT NO. IR 25-2(187)

The Division has determined that Minority Business Enterprises (MBEs) will participate by contracting for a part of the work of this contract. Contract goals, for participation in this contract by MBEs certified by the Department, have been established as follows:

DBE 5.0 Percent

WBE 3.5 Percent

The percentages will be calculated from proposals received for this project according to the following formula:

$$\text{Percentage} = 100 \times \frac{\text{*Dollar amount of work to be contracted to MBEs}}{\text{Total dollar amount of the original contract amount}}$$

* Based on MBE contract unit prices rather than prime contract unit prices.

The goal for DBE listed above shall be considered to have been met for purposes of awarding the project, when the apparent low bidder is a DBE as certified by the Department.

The goal for WBE listed above, shall be considered to have have been met for purposes of awarding the project, when the apparent low bidder is a WBE as certified by the Department.

The goals for DBE and WBE listed above, shall be considered to have been met for purposes of awarding the project, when the apparent low bidder is both a DBE and WBE as certified by the Department.

April 10, 1986

REVISION OF SECTION 102
PROJECT PLANS AND OTHER DATA
COLORADO PROJECT NO. IR 25-2(187)

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

Subsection 102.05 shall include the following:

The following information will be available for review in the Reproduction Branch of the Division, Room 107, 4201 East Arkansas Avenue, Denver, Colorado 80222 until the date set for opening of bids:

CROSS SECTIONS

	Sheet No.
Roadway	101 to 115

The Reproduction Branch will provide an area where contractors can review any available cross sections and computer output data. This material may be taken out of the Reproduction Branch area by either: (1) purchase of the material at the current reproduction price or, (2) deposit of cash or check (payable to: Colorado Department of Highways) equal to the purchase price. The deposit will be refunded if the material is returned by 4:30 p.m. on the second full working day after obtaining the material. If not returned within that time, the deposit will be forfeited.

After contract award, the successful bidder may obtain from the Reproduction Branch at no cost: ten sets of plans and special provisions; and, if available for the project, one set of full size cross sections. If the contractor has not picked up the plans and other available data within six weeks after bid opening, they will be sent to the Resident Engineer in charge of the project. Additional sets of plans and other available data may be purchased on a cash sale basis from the Reproduction Branch at current reproduction prices.

Subcontractors and suppliers may obtain plans and other data from the successful bidder or they may purchase copies on a cash sale basis from the Reproduction Branch at current reproduction prices.

April 10, 1986

REVISION OF SECTION 104
CONSTRUCTION TRAFFIC CONTROL
COLORADO PROJECT NO. IR 25-2(187)

Section 104 of the Standard Specifications is hereby revised for this project as follows:

Subsection 104.04 shall include the following:

During construction of this project, traffic shall use the present traveled roadways, except as specified below.

The Contractor will not be permitted to do any work on the roadways between the hours of 5:30 to 8:30 AM and 3:30 to 7:00 PM. All lanes shall be available for traffic during these hours; at other hours, one lane may be closed to traffic, or as directed by the Engineer.

The 6th Avenue resurfacing shall be accomplished on Sunday evenings through Thursday mornings only, between 10:00 PM and 5:30 AM, with one through-lane remaining open at all times. No work will be permitted during these hours on Fridays or Saturdays.

Before proceeding with construction, the Contractor shall submit a detailed proposal in writing of the method of handling traffic during construction, which shall be subject to the written approval of the Engineer. If, at any time during the construction, the Contractor changes his method of handling traffic, he shall detail the change in writing and submit a letter for approval.

Payment for any traffic control devices, including "Flagging" and "Traffic Control Supervision" shall be contingent upon the approval by the Engineer of the original detailed proposal for handling traffic and any subsequent changes submitted by the Contractor.

The Contractor shall notify the City of Denver Traffic Engineer of the date he intends to start construction.

The Contractor will not be permitted to have construction equipment or materials in the lanes open to traffic at any time, unless directed.

The Contractor is cautioned that all personal vehicle parking will be prohibited where it conflicts with safety, access, or the flow of traffic.

The Contractor shall maintain the existing bikepaths and adequately facilitate the safety of bicycle and pedestrian access throughout the contract construction period. Where sections of the existing bikepaths are to be relocated, or where temporary bypass access is required for safe passage around construction areas, the Contractor shall submit to the Engineer for approvals a sketch showing proposed horizontal alignment (minimum radius of inside edge of pavement-25 feet) and vertical alignment with grades not exceeding 8.0%. The Contractor shall provide a clear

opening for the bikepath through the falsework. The minimum vertical clearance shall be 8.5 feet. Overhead protection shall be provided as required. All weather travelway surfaces shall be provided. The Contractor shall provide a surface treatment for a temporary 8.0 foot wide bikepath, for consideration and approval by the Engineer.

The Contractor shall provide warning signs (black on orange) to include, but not be limited to, "Construction Ahead" and "Be Prepared to Stop". Signs shall precede each detour and be located as specified by the Engineer.

Where construction equipment is scheduled to cross any bikepath, flagmen shall be provided.

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

April 10, 1986

REVISION OF SECTION 107
LEGAL RELATIONSHIPS AND RESPONSIBILITY TO THE PUBLIC
COLORADO PROJECT NO. IR 25-2(187)

Section 107 of the Standard Specifications shall include the following:

Work in the channel of the South Platte River during the April-October period must be capable of passing streamflow that is passed through Chatfield Dam at a rate of 1,500 cfs without notification, 1,500 to 2,200 upon twenty-four-hour notice, and 2,200 to 3,500 cfs upon two days notice. Emergency conditions could require higher releases and shorter notice. For work during November-March period, they must be capable of passing streamflow that is passed through Chatfield Dam at a rate of 700 cfs without notification, 700 to 2,200 cfs upon twenty-four-hour notice and 2,200 to 3,500 cfs upon two days notice. Emergency conditions could require higher releases and shorter notice.

The Contractor shall notify the Tri Lakes Project Manager prior to working in the channel.

Tri Lakes Project Manager: Jack Unit
9300 S Colorado Highway 75
Littleton, Colorado 80125
(303) 979-4120

REVISION OF SECTION 108
PROSECUTION AND PROGRESS
COLORADO PROJECT NO. IR 25-2(187)

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

Subsection 108.03 is hereby deleted and replaced with the following:

108.03 Prosecution and Progress

A. The Contractor shall be responsible for planning, scheduling, and reporting the progress of the work as to ensure timely completion of the work called for in the contract. The Contractor's Progress Schedule shall identify the order in which work will be accomplished.

Meetings may be required to review progress and plan upcoming activities. The meetings will be held when requested by the Engineer or the Contractor. Sufficient notice shall be given to each party in advance of the meeting time.

B. The Contractor shall submit a schedule in two parts as follows:

1. Part One - shall be a preliminary schedule and shall be submitted to the Engineer at or prior to the preconstruction conference. It shall be a schematic (arrow) diagram or comprehensive Bar Chart showing the work stages and operation for all salient features listed elsewhere in these special provisions.

   This portion of the diagram shall be in sufficient detail to allow day-to-day monitoring of the Contractor's operations.

2. Part Two - shall be submitted for the Engineer's approval within thirty (30) calendar days after receiving the Notice to Proceed; the schedule shall include a complete critical path schedule to cover the total Contract Time (240 days). Part Two - shall include a detailed network diagram acceptable to the Engineer with the following features:

   a. It shall be time-scaled in calendar days. All activities shall be plotted on their early start and finish dates.

b. It shall show the order and interdependence of activities and the sequence of work as reflected in the schedule report (see 2.g below). The critical activities shall be prominently distinguished.

c. It shall include, in addition to all construction activities such tasks as mobilization, demobilization, submittal and approval of samples of materials and shop drawings, procurement of significant materials and equipment, and fabrication of special items, as well as installation and testing. It shall also include activities requiring work by others, including but not limited to utilities and railroads.

d. The activities shall be sufficiently detailed so that a reviewer can follow the sequence. For example, the activities for a simple concrete pour might show forming, reinforcing, and placement of concrete on the calendar days they are scheduled to be performed.

e. The diagram shall show for each activity the preceding and following event numbers and the description and duration of the activity in calendar days.

f. The activities shall be organized and described so as to conform to the contract bid items.

g. The diagram shall be accompanied by a schedule report of the network with a tabulation of the following data for each activity:

1) Preceding and following event numbers
2) Activity description
3) Activity duration
4) Earliest start date
5) Earliest finish date
6) Latest start date
7) Latest finish date
8) Total float time

9) Responsibility for activity - e.g., Contractor, Subcontractor, Supplier, etc.

3. With his PART TWO submission, the Contractor shall include the following:

a. A Methods Statement for each major discipline involved in the project, such as removal of concrete, forming, placing of concrete. The Methods Statement shall be a general narrative describing the work to be done and the method by which the work will be accomplished. Included as part of the Methods Statement shall be the quantities of work to be done, the equipment and manpower to do the work, and the production needed to meet the time frame indicated on the schedule. The Methods Statement or any part thereof shall be updated by the Contractor if the Engineer so requests.

b. The Contractor shall participate in the Engineer's review and evaluation of his submissions. Any revisions deemed necessary as a result of this review shall be resubmitted within ten (10) calendar days after the review.

c. The Contractor shall make updated schedules and reports under the following circumstances or as requested:

1) The Contractor shall submit a monthly report of actual construction progress on the first working day of each calendar month by updating his schedule report to reflect all preceding work on the project. If in the opinion of the Engineer, the detailed network diagram requires revision in whole or in part, he shall so direct the Contractor and the Contractor shall submit such revision within ten (10) calendar days.

2) The monthly report also shall show the activities or portion of activities completed during the one (1) month reporting period and the portion completed on the project to date.

3) The monthly report shall state the percentage of revenue actually earned as of the report date.

4) The monthly report shall be accompanied by a narrative description of job progress, problem areas, current and anticipated delaying factors and their anticipated effect, and any corrective actions proposed or taken.

d. The following provisions shall apply to all submissions required by Paragraph b. or c.:

1) Each schedule and report submitted, as above required, shall be furnished in three (3) copies plus one (1) reproducible.

2) The maximum width of the reproducible shall be the maximum width of thirty-six (36) inches.

3) The contract price includes full compensation for all Contractor costs relating to preparation and submission of schedules and reports and revisions thereto.

4) Approval of the Contractor's schedules by the Engineer is not to be construed as relieving the Contractor of his obligation to complete the contract work within the contract time, or as granting, rejecting, or in any other way acting on the Contractor's requests for adjustment for completing remaining contract work, or claims for additional compensation. Such requests shall be processed in strict compliance with other relevant provisions of the contract.

5) Failure of the Contractor to comply with the requirements of this Special Provision, 108.03, shall be grounds for a determination by the Engineer that no further progress payments are to be made until the Contractor is in compliance.

6) The Engineer may provide copies of the Contractor's progress schedule to other parties working within, or affected by, the project's scope of influence as requested and deemed appropriate.

April 10, 1986

REVISION OF SECTION 202
REMOVAL OF STRUCTURES AND OBSTRUCTIONS
COLORADO PROJECT NO. IR 25-2(187)

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

Subsection 202.01 shall include the following:

Removal of structures and obstructions shall include all such items, whether visible or concealed, designated for removal on the plans or by the Engineer. Before submitting his bid, the Contractor shall satisfy himself to the full extent of the existing conditions and number and type of structures and obstructions to be removed, as they relate to this work.

This work shall include the complete removal of structures and obstructions such as, but not limited to, inlets, manholes, utility pits, pipe tunnels, underground gas tanks, stairs, retaining walls, concrete slabs, and foundations, not included for pay in other items of removal. This work shall also include the salvaging of designated materials, the proper disposal of unsalvable materials and backfilling the resulting trenches, holes, and pits where required.

Delete the fourth sentence of the second paragraph of subsection 202.02 and replace with the following:

Cavities left by structure removal within the prism of construction shall be backfilled and compacted as designated to the level of the surrounding ground. Cavities left by structure removal outside the prism of construction and not subject to traffic loads shall be compacted to approximately the density of the surrounding earth.

Subsection 202.05 shall include the following:

All removed concrete, concrete sidewalks, curb and gutter, and asphalt mat not required for use on this project shall become the property of the Contractor and be disposed of by him. The Contractor shall secure a written permit from property owners before disposing of materials on any property.

Before proceeding with construction, the Contractor shall submit a detailed proposal in writing of his method of disposal and place of disposal.

REVISION OF SECTION 202
REMOVAL OF PORTIONS OF PRESENT STRUCTURE
COLORADO PROJECT NO. IR 25-2(187)

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

Subsection 202.01 shall include the following:

This item shall include removal of curb, bridge rail, retaining walls, light pole base, asphalt curbs, cast-in-place reinforced concrete diaphragms, and portions of existing concrete pier caps as shown on the plans.

Subsection 202.02 shall include the following:

Removal operations shall be conducted so that there will be minimum interference to traffic both below and on the structure.

Any damage to the structure portions to remain in place by the contractor in performing the work described above shall be repaired to the satisfaction of the Engineer at the Contractor's expense.

All portions of the bridge, except guard rail, removed as a part of this item shall be disposed of by the contractor as approved by the Engineer. Guard rail to remain the property of CDoH, to be stockpiled on the project site and loaded on CDoH vehicles by the contractor.

Precautions shall be taken during removal operations to prevent material or debris from falling on the railroad below. The Contractor shall be responsible for protecting the public from falling material. Any material which falls on the surfaces below shall be removed and such removal will not be measured and paid for separately, but shall be included in the work.

All methods, equipment, and sequence of removal used to accomplish this item shall be approved by the Engineer.

BASIS OF PAYMENT

Subsection 202.07 shall include the following:

Payment for the removal and disposal of the portions of the existing structures will be made at the contract unit price and shall be full compensation for all sawing, removing, hauling, and disposal of such items, and for all labor, tools, and equipment necessary to complete the work.

Payment will be made under:

Pay Item	Pay Unit
Removal of Portions of Present Structure	Lump Sum

April 10, 1986

REVISION OF SECTION 206
STRUCTURE BACKFILL
COLORADO PROJECT NO. IR 25-2(187)

Section 206 of the Standard Specifications is hereby revised as follows:

Subsection 206.02(a) shall include the following:

At the Contractor's option, Structure Backfill (Class 1) and (Class 2) meeting the following gradation requirements may be used for backfilling culvert pipes, sewer pipes, and minor inlet structures, but not bridge or retaining walls.

Sieve Designation	% By Weight Passing Lab Sieves
3/8 Inch	100
No. 4	60 - 90
No. 8	0 - 45
No. 16	0 - 25
No. 50	0 - 6
No. 200	0 - 2

Subsection 206.03 shall include the following:

Compaction of Structure Backfill will not be required if material meeting the above gradation is used.

The Contractor at this option will be permitted to substitute material of the above gradation for the required embankment material in trench backfilling operations; however, the top one foot shall be the required embankment material.

April 10, 1986

REVISION OF SECTION 206
STRUCTURE EXCAVATION AND BACKFILL
COLORADO PROJECT NO. IR 25-2(187)

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

Subsection 206.06 (a) shall conclude with the following:

"...the revised foundation plan <u>or as shown on the plans."</u>

April 10, 1986

REVISION OF SECTION 213
EROSION BALES
COLORADO PROJECT NO. IR 25-2(187)

Section 213 of the Standard Specifications is hereby revised to include erosion bales for temporary erosion control on this project as follows:

DESCRIPTION

This work shall consist of furnishing, installing, and removing erosion bales and clean up in accordance with these specifications and in reasonably close conformity with the lines and grades shown on the plans or established.

MATERIALS

Erosion bales shall be hay, straw, or other approved material containing approximately 5 cubic feet of material and weighing not less than 35 pounds. Bales shall be bound with wire.

CONSTRUCTION REQUIREMENTS

Erosion bales shall be installed and removed as directed.

METHOD OF MEASUREMENT

The quantity of erosion bales to be measured under this item will be the actual number of erosion bales, furnished, installed, and removed in accordance with the foregoing requirements, completed, and accepted.

BASIS OF PAYMENT

The accepted quantities for erosion bales measured as provided above will be paid for at the contract unit price per bale.

Payment will be made under:

Pay Item	Pay Unit
Erosion Bales	Each

April 10, 1986

REVISION OF SECTION 213
METAL LANDSCAPE BORDER
COLORADO PROJECT NO. IR 25-2(187)

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

Subsection 213.01 shall include the following:

This work shall consist of furnishing and installing metal landscape border in accordance with these specifications and in reasonably close conformity to the lines and grades shown on the plans or established.

Subsection 213.02 shall include the following:

A. Metal Border

The metal landscape border shall consist of a strip metal, such as steel conforming to ASTM A 569 or approved equal. Steel surfaces shall be descaled and furnished with a coat of green paint. Metal border shall be punched with two slots at approximately 30 inch intervals to accommodate tapered anchor stakes. Ends of metal border shall overlap the next adjacent section a minimum of eight inches. Guide dimensions are as follows:

Size	3/16" thick and 10" depth minimum
Approximate Length	16 feet or 20 feet
No. Stakes	7 for 16 feet or 8 for 20 feet

B. Stakes

Stakes shall be metal, such as steel or approved equal, and of such a size and taper to fit in the punched slots of the metal border. Stakes shall be painted green. Stakes shall be at least 16 inches long and shall extend below the top at the metal border when in place.

Subsection 213.03 shall include the following:

Metal landscape border shall be installed along the lines and at the grades shown on plans or as directed. The metal border shall be inserted into the ground by driving against the anchor stakes. Ground may be moistened to ease the entrance of metal border into the soil. Driving on edge of metal border will not be permitted except when the edge is properly shielded.

Subsection 213.04 shall include the following:

Metal landscape border will be measured by the linear foot of completed and accepted metal border. Stakes will not be measured or paid for separately, but shall be included in the work.

REVISION OF SECTION 213
METAL LANDSCAPE BORDER
COLORADO PROJECT NO. IR 25-2(187)

Subsection 213.05 shall include the following:

The accepted quantity of metal landscaping border will be paid for at the contract unit price per linear foot.

Payment will be made under:

Pay Item	Pay Unit
Metal Landscape Border (3/16 x 10 inch)	Linear Foot

April 10, 1986

REVISION OF SECTION 213
MULCHING (WOOD CHIP)
COLORADO PROJECT NO. IR 25-2(187)

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

Subsection 213.02 shall include the following:

Wood chip mulch shall consist of fresh, moist fir fiber material having the following approximate dimensions: Width--1/4" to 1/2", length--3" to 4". A sample of mulch shall be submitted in advance to the Engineer for approval.

Subsection 213.03 shall include the following:

A 6 inch thick layer of wood chip mulch shall be uniformly applied to all landscaped areas as shown on the plans or as directed.

Subsection 213.04 shall include the following:

The quantity of wood chip mulch to be measured under this item will be the actual number of cubic feet placed in accordance with the foregoing requirements, completed and accepted. Method of Measurement will be the actual number of square feet placed multiplied by the plan thickness.

Subsection 213.05 shall include the following:

Accepted quantities for wood chip mulch measured as provided above will be paid for at the contract unit price per cubic foot.

Payment will be made under:

Pay Item	Pay Unit
Mulching (Wood Chip)	Cubic Foot

April 10, 1986

REVISION OF SECTION 213
WOOD CELLULOSE FIBER MULCH AND TACKIFIER
COLORADO PROJECT NO IR 25-2(187)

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

Subsection 213.01 shall include the following:

This work shall consist of furnishing and applying hydromulch with tackifier on roadway ditches and slopes indicated on the plans or as directed by the Engineer.

In subsection 213.02, delete the second paragraph and replace with the following:

The hydromulch material shall consist of virgin wood fibers manufactured expressly from clean whole wood chips. The chips shall be processed in such a manner as to contain no growth or germination inhibiting factors. Fiber shall not be produced from recycled materials such as sawdust, paper, cardboard, or residue from pulp and paper plants.

The wood cellulose fiber mulch shall conform to the following specifications:

1. Percent moisture content.....10.0% ± 3.0%

2. Percent Organic Matter*.....99.3% ± 0.2%

   (Wood Cellulose Fiber)

3. Percent Ash Content*.....0.7% ± 0.2%

4. pH.....4.9% ± 0.5%

5. Water Holding Capacity**.....1200-1600 grams

*Oven-Dried Basis
**Per 100 grams of fiber

The wood cellulose fibers of the mulch must maintain uniform suspension in water under agitation. Upon application, the mulch material shall form a blotter-like mat covering the ground. This mat shall have the characteristics of moisture absorption and percolation and shall cover and hold seed in contact with the soil.

The wood cellulose fiber mulch shall be dyed green to aid in visual metering during application. The dye shall be biodegradable and not inhibit plant growth.

The wood cellulose fiber mulch shall be packaged in units containing current labels, the manufacturer's name, the net weight, and certification that the material meets the foregoing requirements for wood cellulose fiber mulch.

Material for mulch tackifier shall consist of a free-flowing non-corrosive powder produced from the natural plant gum of Plantago Insularis (Desert Indianwheat):

-Continued-

REVISION OF SECTION 213
WOOD CELLULOSE FIBER MULCH AND TACKIFIER
COLORADO PROJECT NO IR 25-2(187)

The powder shall possess the following properties:

1. Protein Content.....1.62%
2. Ash Content.....2.70%
3. Fiber Content.....4.00%
4. $_pH$ (1% Solution).....6.8
5. Settleable Solids.....5.0%

Subsection 213.03(b) shall include the following:

Mixing Procedure for the hydraulic mulch/tackifier mixture shall be as follows:

1. Fill tank with water approximately 1/4 full.
2. Continue filling while agitating with engine at full rpm.
3. Pour tackifier, at a moderate rate, directly into area of greatest turbulence.
4. With the recommended amount of tackifier in solution, add wood cellulose fiber mulch. Do not add fertilizer.

Apply the hydromulch/tackifier mixture at the following rate:

Wood Cellulose Fiber Mulch	Tackifier
2,000 lbs or 1 Ton/Acre	100 lbs/Acre

Subsection 213.04 shall include the following:

The quantity of wood cellulose fiber hydromulch and tackifier mixture will not be measured, but shall be the quantity shown on the plans, completed and accepted; except that measurements will be made for revisions requested by the Engineer, or for discrepancies of plus or minus five percent of the total quantitiy shown on the plans. Measurements for acres will be by slope distances.

Subsection 213.05 shall include the following:

The accepted quantities for hydromulch/tackifier mixture will be paid for at the contract unit price per acre.

Payment will be made under:

Pay Item	Pay Unit
Mulching (Hydraulic)	TON

April 10, 1986

REVISION OF SECTION 214
PLANTING
COLORADO PROJECT NO. IR25-2(187)

Section 214 of the Standard Specifications is hereby revised for this project as follows:

Subsection 214.02 shall include the following:

All shrub and tree plantings shall receive fertilizer tablets during the backfilling operation. Analysis of fertilizer tablets shall be: 21 gram tablet with 20N-10P5K in a slow release formulation. Each shrub shall receive two tablets and each tree shall receive three tablets.

In Subsection 214.03, Planting, delete the first paragraph and replace with the following:

During the backfilling operation, fertilizer tablets shall be placed 6-8 inches deep and 2 inches away from the root ball or root tips of shrubs or trees.

Subsection 214.06 shall include the following:

Fertilizer tablets shall not be paid for separately, but shall be included in the cost of the work.

April 10, 1986

REVISION OF SECTION 403
HOT BITUMINOUS PAVEMENT (GRADING E and EX)
COLORADO PROJECT NO. IR 25-2(187)

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

Subsection 403.02 shall include the following:

The hot bituminous mix shall conform to the following:

TABLE 403-1

PROPERTY	TEST METHOD	TOP LAYER	BELOW TOP
Voids, percent - Grading E	CPL 5105	3-4	3-6
Voids, percent - Grading EX	CPL 5105	3-6	3-8
Stability, minimum	CPL 5105	37	37
Strength Coefficient, min.	CPL 5105	0.44	0.44
Index of Retained Strength, minimum	CPL 5104	75	75

The asphalt cement for this grading shall be AC-10 (Fortified).
Minimum job mix formula asphalt content shall be as follows:
Gr. E = 5.5%
Gr. EX = 5.5%

The top lift of the hot bituminous pavement shall not contain more than 30 percent reclaimed material.

Subsection 403.03 shall include the following;

When ordered by the Engineer, a tack coat shall be applied between pavement courses.

Paving of the top lift of hot bituminous pavement will not be permitted between October 1st and April 1st, unless otherwise approved by the Engineer.

The Contractor shall use an approved anti-stripping additive.

In Subsection 403.05, delete the last paragraph and replace with the following:

Haul, aggregate, asphalt recycling agent, additives, and all other work necessary to complete the item will not be paid for separately but shall be included in the unit price bid.

Material used for tack coat and asphalt cement will be measured and paid for as provided in Section 411.

April 10, 1986

REVISION OF SECTIONS 412 and 601
CONCRETE (BATCHING)
COLORADO PROJECT NO. IR 25-2(187)

Sections 412 and 601 are hereby revised for this project as follows:

Subsections 412.08 and 601.06 shall include the following:

The Contractor shall furnish a one sheet load slip containing the information required by AASHTO M 157, Section 13, subsections 13.1 and 13.2 with each batch of concrete, except for bridge deck concrete. In addition, the Division's design number shall be shown on each load slip.

The DOH Form 281 is available upon request.

Concrete delivered without a load slip containing complete information as specified will be reason for rejection.

The drum on each mixer shall be reversed prior to charging to preclude any wash water remaining in the mixer.

Division personnel on the project will sample and test the concrete at the work site as required by published Division Specifications and Materials Manual.

April 10, 1986

REVISION OF SECTION 502
PILING
COLORADO PROJECT NO. IR 25-2(187)

Section 502 of the Standard Specifications is hereby revised for this project as follows:

In subsection 502.05, delete the second paragraph and replace with the following:

Hammers for pile driving shall conform to the following requirements:

Steam, air, or diesel hammers may be used to drive all types of piles. They must develop an energy of at least 26,000 foot-pounds per blow.

Delete Subsection 502.06 and replace with the following:

Drilling holes to facilitate pile driving shall be required at the locations shown on the plans. Drilled holes shall be 18 inches in diameter and shall be backfilled with a bentonite slurry before piling is driven. The cost of the bentonite slurry shall be included in the cost of the work.

April 10, 1986

REVISION OF SECTION 506
RIPRAP (SPECIAL)
COLORADO PROJECT NO. IR 25-2(187)

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

Subsection 506.02 shall include the following:

Riprap (Special) shall consist of hard, dense, sound, river-washed cobble stone as nearly round as practicable.

In subsection 506.02 add the following to the table:

		Guide for Size Determination	
Pay Item	Stone Size	Volume Cu.Ft.	Weight Lbs.
Riprap (Special)	6 Inch	0.07	10

In subsection 506.03 delete the first paragraph and replace with the following:

Riprap and Riprap (Special) shall be placed to conform to the plan details. The larger stones comprising these materials shall be placed first and arranged in close contact and, as far as practicable, shall be keyed together. Any large interstices shall be as nearly filled as possible by placement of intermediate and smaller size stones and spalls. In the areas immediately adjacent to culvert ends, riprap shall be hand-placed so as to avoid damage to the culvert and to ensure that the culvert end section is firmly embedded and tightly held in the riprap.

Large rock encountered during excavation for placement of riprap shall be left in place.

In subsection 506.05 delete the last paragraph and replace with the following:

Excavation for placement of all Riprap (Special) will not be measured or paid for separately, but shall be included in the work.

April 10, 1986

REVISION OF SECTIONS 512 and 705
BEARING DEVICE TYPE III
COLORADO PROJECT NO. IR 25-2(187)

Section 512 of the Standard Specifications is hereby revised for this project as follows:

Subsection 512.02 shall include the following:

Polytetrafluorethylene (PTFE) sheet and strip and the polyether urethane structural element (disc) shall meet the requirements set forth in subsection 705.06 as revised in this special provision.

Delete subsection 512.05 and replace with the following:

Type III bearings shall consist of either Type III(A) bearings or Type III(B) bearings. The Contractor shall state at the preconstruction conference the specific manufacturer and model number of the bearings he intends to furnish and install.

Type III(A) bearings shall consist of a top plate and a tapered loading piston machined from a solid steel plate operating on an elastomeric pad confined in a steel cylindrical retainer which is part of a base machined from a solid steel plate with no bolting or welding of these components permitted. The shape characteristics, clearances, and sealing mechanism of the piston and cylinder must be designed to prevent extrusion of the elastomer under load of rotational movement. When guide bar or keyway systems are required, they shall move against the upper bearing steel plate so that guide and plate vertical interfaces are parallel for all degrees of vertical rotation.

Type III(B) bearings shall consist of a polyether urethane structural element (disc) confined by upper and lower steel bearing plates. The bearing shall be equipped with a shear restriction mechanism to prevent movement of the disc. The upper steel bearing plate shall be faced with polyetrafluorethylene (PTFE) sheet and support a steel top bearing plate. The mating surface of the steel top bearing plate shall be faced with polished stainless steel. The operating coefficient of static friction between the stainless steel and the PTFE sheet, when loaded, shall not exceed 0.03 at initial installation. If guide bar or keyway systems are required, they and their mating steel surfaces shall be faced with strips of either PTFE or PTFE stainless steel as shown on the plans. When guide bar or keyway systems are required, they shall move against the upper bearing steel plate so that guide and plate vertical interfaces are parallel for all degrees of vertical rotation.

TFE or PTFE sheet shall be bonded to and recessed into its steel substrata. TFE and PTFE sheet shall have a minimum finished thickness of 3/16 inch and be recessed for at least one-half its thickness into its steel substrata. The surface of the TFE or PTFE sheet in contact with stainless steel shall be polished for burnished to ensure smooth and low-friction movement of the bearing.

Epoxy bonded TFE and PTFE sheets shall be treated by the sodium napthalene or sodium ammonia process on the side to be bonded.

The bonding agent shall be applied to the full area of the contact surfaces. The bonding shall be performed at the factory of the manufacturer of the bearings under controlled conditions and in accordance with instructions of the manufacturer of the adhesive. The TFE or PTFE surface shall be smooth and free of bubbles after completion of the bonding operation. TFE and PTFE surfaces shall be polished.

The mating surface to the TFE or PTFE shall be oriented so that sliding movements will cause dirt and dust accumulation to fall from the mating surface.

Holes or slots shall not be used in the sliding surfaces.

Sealing rings for containing elastomer in the Type III(A) bearings shall be provided. They shall be of a brass or bronze material that the manufacturer of the bearing shall demonstrate to be effective for the purpose intended.

Mechanically fastened TFE or PTFE strips may be fastened to guide bars or keyway systems as shown on the plans or as approved. The type, size, and number of fasteners shall have full bearing of the fastener used in the TFE or PTFE strip and its mating steel surface.

The stainless steel mating surface to the TFE or PTFE shall be an accurate flat surface and shall have a minimum Brinnell hardness of 125 and a surface roughness value of less than 5 micro-inches. The mating surface shall completely cover the TFE or PTFE surface in all operating positions of the bearing.

Structural steel plates for all parts shall conform to AASHTO M183. The mating surfaces of structural steel elements shall be ground flat to within 0.01 inches per foot. Surface roughness value shall be ANSI 500 in accordance with American National Standards Institute B46.1.

All surfaces of structural steel components not connected to stainless steel or the TFE or PTFE shall be completely zinc metalized in accordance with American Welding Society Designation AWS C.2.2, latest issue, to a minimum thickness of eight mils on exposed surfaces and three mils on protected surfaces. A hot-galvanizing process in accordance with AASHTO Designation M 111-78 may be substituted for the zinc metallizing.

Subsection 512.06 shall include the following:

When used to support girders, the bearing shall satisfactorily provide for the movement of the girder concrete as shown on the plans.

Bearings under prestressed concrete girders shall provide for rotation caused by changes in camber due to the method or procedure for pretensioning or post-tensioning the girders. The amount of rotation is shown on the plans.

The bearing shall be marked in such a manner as to assist the Contractor in following the Engineer's recommendations for positioning the bearing at the time of erection. Details shall be provided to positively locate all elements of the bearing.

Anchorages and bearing parts shall accommodate the horizontal and vertical loads shown on the plans.

The following bridge seat unit stress will apply only where the edge of the bridge seat projects at least three inches beyond the edge of plate.

The bearing stress on the loaded concrete area shall be $0.3f'_c$ (f'_c = the strength of the loaded area concrete) unless modified by the following:

(a) When supporting surface is wider on all sides than the loaded area, the allowable bearing stress on the loaded area may be increased by $\sqrt{A_2/A_1}$, but not more than 2.

(b) When the supporting surface is sloped or stepped, A_2 may be taken as the area of the lower base of the largest frustrum of a right pyramid or cone contained wholly within the support and having for its upper base the loaded area, and having side slopes of 1 vertical to 2 horizontal.

(c) When the loaded area is subjected to high edge stresses due to deflection or eccentric loading, the allowable bearing stress on the loaded area shall be multiplied by a factor of 0.75. The requirements of (a) and (b) shall also apply.

Bearings shall be designed and fabricated for ease of replacement or inspection at any time after completion of bridge. This shall include provisions to allow removal and replacement of all bearing components excluding top cast-in-place masonry plates, with no more than 1/4 inch maximum vertical lift of the superstructure.

Delete subsection 512.07 (c)3 and replace with the following:

3. The test shall be conducted at maximum working stress for the TFE or PTFE surface with the test load applied continuously for 12 hours prior to measuring friction.

Subsection 512.07(c) shall include the following:

6. The bearing specimen shall be preloaded for a period of twelve to twenty-four hours, then cycled for one hundred to two hundred fifty cycles under the design pressure and rotation. Upon completion of the test, the bearing unit shall be disassembled and inspected. Damage to the bearing will be cause for rejection.

7.a. A Type III(A) test bearing shall be loaded to 150% of its rated compressive capacity and subjected to a rotational range of 0.02 radians (1.1456°) for a period of 30 minutes. While under load, the bearing shall be examined carefully to determine if there is any extrusions of the confined elastomer past the sealing device used. Following this test the bearing shall be disassembled and the bearing components examined. Any bearing exhibiting extrusion of the elastomer or damage to its components shall be cause for rejection.

7.b. A Type III(B) test bearing shall be loaded to 150% of its rated compressive capacity and subjected to a rotational range of 0.02 radians (1.1456°) for a period of 30 minutes. While under load, the bearing shall be examined carefully to determine if there is continuous and uniform contact between the polyether urethan element and bearing plates, and between the sliding steel top and upper bearing plates. Any observed "lift-off" shall be cause for rejection. Any visual defects observed during the test or found after inspecting the disassembled bearing upon completion of the test will be cause for rejection.

In subsection 512.07 delete the last sentence and replace with the following:

The Bearing Manufacturer shall provide certification of the steel, TFE or PTFE, elastomer, preformed pad, and other materials used in the construction of the bearing including test reports on each of the materials used, along with notification of fabrication completion. The Manufacturer's certificate shall confirm that sample bearings have been tested and that the bearings supplied will meet the requirements as set forth in the Bearing Manufacturer's current literature.

Subsection 512.10 shall include the following:

The Contractor shall locate the base plate assembly at the proper elevation and orient it in the proper direction. The location and orientation of the bridge bearing shall be set relative to the base of the bridge bearing according to the Engineer's recommendations for the temperature (plus creep and shrinkage movement for bearing under concrete girders) at the time of erection. Temporary adjustable clip angles shall be provided on the bearing to maintain this position and orientation of all bearing components until the bearing is loaded by its girder.

The bridge bearings must be fully supported over the entire area of the bottom and upper surfaces at all times when under load.

In subsection 512.2 delete the second sentence and replace with the following:

Welding to steel plates which have a bonded TFE or PTFE surface will be permitted providing welding procedures are established which restrict the maximum temperature reached by the bonded areas to less than 300 degrees F as determined by temperature indicating wax pencils or other approved means.

Subsection 512.14 shall include the following:

The Contractor shall certify to the Engineer that a skilled representative of the Bearing Manufacturer will be available to the Contractor to give such aid and instruction in the installation of the bearings as required to obtain satisfactory results.

The skilled representative shall be present during the initial installation of the bearings. The representative shall remain on the job until, in the opinion of the Engineer, the bearing installation is proceeding smoothly and the workmen are familiar with the work required for each installation. The Contractor shall also arrange to have the representative present at such other times as the Engineer may request.

Subsection 512.15 shall include the following:

Anchor details shall be included on the shop drawings for approval.

Subsection 512.18 shall include the following:

Masonry plates, bearing plates, auxiliary plates, anchor bolts, and lead plates of bearing assemblies shall not be measured and paid for separately but shall be included in the work.

Section 705 of the Standard Specifications is hereby revised for this project as follows:

Subsection 705.06 shall include the folowing:

Polyether Urethane Structural Element (Disc)

The polyether urethane structural element (disc) shall be molded from a polyether urethane compound which shall conform to the following requirements:

Physical Property	ASTM Test Method	Requirements Min.	Max.
Hardness, Type D Durometer	D2240	46	-
Tensile Stress, psi	D412		
At 100% Elongation		1,500	-
At 300% Elongation		2,800	-
Tensile Strength, psi	D412	4,000	-
Ultimate Elongation, %1	D412	220	-
Compression Set 22 Hrs. at 158° F, %	D395	-	40

Polytetrafluorethylene Sheet and Strip

Polytetrafluorethylene (PTFE) sheet and strip shall be manufactured from pure virgin (not reprocessed) unfilled TFE resin; or from TFE resin uniformly blended with either 15% glass fiber or 25% carbon (maximum filler, percent by weight).

Finished PTFE sheet and strip shall be resistant to all acids, alkalis, and petroleum products, stable at temperatures from -360° F to + 500° F, nonflammable, nonabsorbing of water, and shall conform to the following physical requirements:

Physical Property	ASTM Test Method	Requirements		
		Unfilled	Filled 15% Glass	Filled 25% Carbon
Ultimate Tensile Strength psi, min.	D638	2,800	2,000	1,300
Ultimate Elongation,%, min.	D638	200	150	75
Specific Gravity, min.	D792	2.13	2.18	2.05

April 10, 1986

REVISION OF SECTION 513
BRIDGE DRAIN (SPECIAL)
COLORADO PROJECT NO. IR 25-2(187)

Section 513 of the Standard Specifications is hereby revised for this project as follows:

Delete Section 513 and replace with the following:

DESCRIPTION

513.01. This work shall consist of furnishing and placing bridge drains and 8" diameter pipes in accordance with the details shown on the plans and in the specifications.

MATERIALS

513.02. The 8" diameter pipe shall meet the requirements of ASTM A 120, Schedule 40. Where applicable, fittings shall be standard items manufactured for welded joining. Where necessary for handling and shipping, the downspouts shall be jointed in field using groove-type mechanical couplings at approved locations.

Structural Steel plates, bars, and shapes required in the fabrication of support brackets shall be of ASTM A 36 steel.

Anchor bolts shall meet the requirements of ASTM A 307.

All steel support brackets, 8" diameter pipe, and required piping hardware shall be galvanized after fabrication.

Materials used in the manufacture of bridge drain castings shall conform to ASTM A 536 for ductile iron.

CONSTRUCTION REQUIREMENTS

513.03. The Contractor shall submit shop drawings as specified in Section 105 of the Standard Specifications. Drain inlets shall be placed and secured at the locations shown on the plans prior to the placement of concrete. Drain inlets damaged during the placement of concrete shall be repaired to the satisfaction of the Engineer.

METHOD OF MEASUREMENT

513.04. Bridge drains will be measured by the number of units installed and accepted. Eight inch diameter pipes, splash blocks, support brackets, riprap (special) and other necessary drainage system incidentals shall be included in Bridge Drain (Special).

BASIS OF PAYMENT

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

Payment will be made under:

Pay Item	Pay Unit
Bridge Drain (Special)	Each

REVISION OF SECTION 518
BRIDGE COMPRESSION JOINT SEALER
COLORADO PROJECT NO. IR 25-2(187)

Section 518 of the Standard Specifications is hereby revised for this project to include the following:

DESCRIPTION

This work shall consist of furnishing and placing an expansion device of the type shown on the plans at the location shown on the plans and in accordance with these specifications. The device shall seal the surface as indicated on the plans, and prevent water from seeping through the pavement. Any seeping of water through the joint will be cause for rejection of the expansion device.

Definitions

A. Expansion Device. The device shall consist of a compression seal, adhesive, and epoxy as shown on the plans, required by the manufacturer, or specified herein. All materials shall be combined as noted in the Contract Documents or as recommended by the manufacturer of the compression joint seal.

B. Joint. The opening provided between two portions of pavement to allow for expansion of contraction.

MATERIALS

The Contractor shall furnish a manufacturer's certification that the materials proposed for use on the project have been pretested and will meet the requirements as set forth in the manufacturer's current literature.

Compression joint seal shall be closed cell, foamed, cross-linked ethylene vinyl acetate, low density polyethylene copolymer compound that is resistant to abrasion, oxidation, oil, gasoline, or similar materials. The expansion/contraction range shall be 25% tension and 50% compression.

The compression joint seal shall be installed in one continuous length for each joint to be sealed.

Size tolerance: The preformed joint material shall be of the size shown on the plans within a tolerance of plus 10% and minus 2%.

An approved lubricant-adhesive shall be used in installation of the compression joint seal. It shall be compatible with the compression joint seal and concrete, and be relatively unaffected by the normal moisture in the concrete. It shall remain fluid at temperatures between 5 degrees F and 120 degrees F, and shall be stored at temperatures between 50 degrees F and 80 degrees F. It shall not be more than 9 months old when used. Epoxy, when required, shall be compounded in accordance with the Manufacturer's recommendations and approved by the Engineer.

Two copies of the product literature containing pertinent materials and installation data for the device supplied on this project shall be furnished to the Engineer at least two weeks prior to the installation of the expansion device.

REVISION OF SECTION 518
BRIDGE COMPRESSION JOINT SEALER
COLORADO PROJECT NO. IR 25-2(187)

CONSTRUCTION REQUIREMENTS

At the discretion of the Engineer, the manufacturer may be required to furnish facilities for testing and inspection of the completed device or a representative sample in his plant or at an independent test facility. The inspectors shall be allowed free access to the necessary parts of the manufacturer's plant and test facility. The manufacturer shall provide a technical representative to be present at all times while the expansion device is being installed.

The compression joint seal shall be installed in strict accordance with the manufacturer's written instructions and this specification. In case of conflict between the two, this specification shall rule.

Prior to the application of adhesives, all surfaces which will come in contact with the adhesive shall be completely dried, cleaned, free of sharp edges, and free of laitance. After cleaning, surfaces that will be in contact with the adhesive shall be primed and the adhesive applied in accordance with the instructions of the manufacturer of the adhesive. Special care shall be taken to ensure that all joints are completely coated with adhesive.

The Contractor shall use hand-operated equipment, as recommended by the manufacturer, for applying the lubricant-adhesive and for installing the compression joint seal. The compression joint seal shall be recessed 1/8 inch.

Placement of the compression joint seal shall not be permitted when the ambient temperature is 35° F or below, or when temperatures are expected to fall below 35° F at any time during a period of twelve (12) hours following placement, unless the entire expansion device is protected from freezing by a heating enclosure.

METHOD OF MEASUREMENT

Bridge compression joint sealer will be measured by the linear foot as shown on the plans completed and accepted.

BASIS OF PAYMENT

The accepted quantity of bridge compression joint sealer will be paid for at the contract unit price per linear foot.

Payment will be made under:

Pay Item	Pay Unit
Bridge Compression Joint Sealer	Linear Foot

Payment will be full compensation for all work necessary to complete the item.

April 10, 1986

REVISION OF SECTION 518
BRIDGE EXPANSION DEVICE (0 - 9 INCH)
COLORADO PROJECT NO. IR 25-2(187)

Section 518 of the Standard Specifications is hereby revised for this project to include the following:

DESCRIPTION

This work shall consist of fabricating, furnishing, and installing a modular expansion joint device of the type shown on the plans at the location shown on the plans and in accordance with these specifications. The modular expansion joint device shall seal the deck suface, gutters, curbs, and walls as indicated on the plans, and prevent water from seeping through the superstructure slab. Any seeping of water through the joint will be cause for rejection of the expansion device. The Contractor shall state at the preconstruction conference the specific manufacturer and model number of the device he intends to furnish and install.

Modular joint systems supplied for this work shall be of the following general description and shall meet all of the requirements of this specification.

a) Wabo-Maurer--as furnished by:

Watson-Bowman Acme
95 Pineview Drive
Amherst, New York 14120 Phone: (716) 691-7566

b) Maurer--as furnished by:

D.S. Brown Company
PO Box 158
North Baltimore, Ohio 45872 Phone: (419) 257-3561

Only a continuous full-length modular joint system supplied by either of the foregoing suppliers will be acceptable. No other supplier will be considered.

Definitions

A. Modular Expansion Joint Device

The device shall consist of premolded elastomeric expansion joint seals mechanically held in place by extruded steel separation beams. Each transverse separation beam shall be individually supported by an independent support bar welded to the separation beam. The device shall provide equidistance control of the premolded sealers.

All materials shall be combined as noted in the contract documents or as recommended by the manufacturer of the modular expansion joint device. Modular expansion device shall be referred to throughout this specification as the expansion device.

B. Joint

The opening provided between two portions of a structure to allow for expansion and contraction.

REVISION OF SECTION 518
BRIDGE EXPANSION DEVICE (0 - 9 INCH)
COLORADO PROJECT NO. IR 25-2(187)

MATERIALS

The Contractor shall furnish a manufacturer's certification that the materials proposed for use on the project have been pretested and will meet the requirements as set forth in the manufacturer's current literature.

The material shall not be installed in the work prior to the Engineer's approval.

The modular joint system and all its component parts, including stiffening plates and anchorages, shall be supplied by the manufacturer. The manufacturer shall certify that the following components meet the listed requirements:

Hollow Beams and Steel Extrusions	ASTM A588 or A242
Sealer	As per manufacturer current literature
Lubricant Adhesive	As per manufacturer current literature
Headed Studs	As per manufacturer current literature

Structural steel angles, steel cover plates, steel sliding plates, and anchors shall conform to the specifications of AASHTO M-183.

Two copies of the product literature containing pertinent materials and installation data for the device supplied on this project shall be furnished to the Engineer at the same time as the shop drawings are sent in for review.

CONSTRUCTION REQUIREMENTS

The Contractor shall submit shop drawings as specified in the revision of Section 105 of the Standard Specifications. The shop drawings shall be submitted to CDoH within ninety days after the award of contract. At the discretion of the Engineer, the manufacturer may be required to furnish facilities for inspection of the completed device or a representative sample in his plant. The inspectors shall be allowed free access to the necessary parts of the manufacturer's plant. The manufacturer shall provide a technical representative to be present at all times while the expansion device is being installed. The contractor shall notify the expansion device manufacturer of the scheduled installation a minimum of two weeks prior to the installation date.

The expansion device shall be anchored as shown on the plans. Cover plates shall be anchored to the concrete with cast-in-place inserts. Bolts shall be cadmium plated. The expansion device shall be accurately set and securely supported at the correct grade and elevation and the correct joint opening as shown on the plans and on the shop drawings.

The structure temperature shall be measured by recording the surface temperature of the concrete with a surface thermometer as described below.

Record the temperature of the underside of the concrete slab at each end of the superstructure element adjacent to the expansion joint. Take the average of the readings to use with the temperature chart shown on the plans. In lieu of surface readings, internal slab readings may be taken by drilling a 1/4" 0 hole 3" into the concrete slab; filling the hole with water, and inserting a probe thermometer.

Details for curb units and any other required details shall be shown on the shop drawings and subject to approval of the Engineer.

All ferrous metal portions of the expansion device not completely enclosed in elastomers or imbedded in concrete shall be painted with two field coats of paint as directed.

Immediately prior to installation, the joint system shall be inspected by the Engineer for proper alignment, and complete bond between the neoprene sealer and the steel, and proper stud placement and effectiveness. No bends or kinks in the joint system steel shall be allowed (except as necessary to follow the roadway grades). Nor shall the straightening of such bends or kinks be allowed. Any joint system exhibiting bends or kinks shall be removed from the work site and replaced by a new joint system at the expense of the Contractor. Neoprene sealer not fully bonded to the steel shall be fully bonded at the expense of the Contractor. Studs shall be inspected visually, and shall be given a light blow with a 4 lb. hammer. Any stud which does not have a complete end weld, or does not emit a ringing sound when struck a light blow with a hammer, shall be replaced. Studs located more than one inch in any direction from the location shown on the shop drawings shall be carefully removed and a new stud placed in the proper location. All stud replacements shall be at the expense of the Contractor.

Any mechanical devices supplied to set the joint system to the proper width shall be disposed of by the contractor.

In order to perform the work of installing the joint systems in a proper manner, some portions of the curb and parapet cannot be constructed until after the expansion device is installed. At such times that the necessary concrete is placed, existing surfaces shall receive a coating of epoxy polysulfide grout. The grout shall be placed no sooner than two hours prior to concrete placement. The cost of the grout shall be included in the unit price bid for the concrete.

The modular joint system manufacturer's instructions for the proper installation of the joint system shall be entered on the shop drawings. Shop drawings which lack manufacturer's installation instruction may be returned without approval.

All metal surfaces to come in contact with the neoprane sealer shall be blast cleaned in accordance with the requirements of Steel Structures Painting Council Surface Preparation No. 6 (SSPC-SP6)--Commercial Blast Cleaning. After cleaning, all cleaned surfaces shall exhibit a clean quality of CSa2, or better, as defined by Steel Structures Painting Council Standard SSPC Vis 1.

The cleaned metal surfaces shall be protected from rusting until such a time as the sealer and lubricant adhesive are placed against the metal surface. Any cleaned metal surface upon which rusting appears shall be recleaned in accordance with the foregoing at no additional expense to the State.

Each modular expansion joint system shall be fabricated as a single entity. It shall fit the full width of the structure as indicated on the Contract Plans. The system shall be preset by the manufacturer prior to shipment. Presetting shall be done in accordance with the joint opening at 70° F, which is indicated on the Contract Plans.

Construction Details: The modular expansion joint system shall be installed in strict accordance with the manufacturer's instructions, this specification, and the advice of their official representative. The permanently installed joint system shall match exactly the finished roadway profile and grades. After the joint system has been permanently installed, a water-tight integrity test shall be done as directed by the Engineer.

The words "permanently installed," as used above, shall be interpreted to mean that any work necessary to be done to any other part of the structure in order to achieve a truly complete permanent installation has been done. This will apply even if the other work is to be paid for under other items of the contract.

All certifications from the joint manufacturer's representative, provided by the prime contractor to the Engineer, shall be in writing.

After the modular joint system has been set to its final line and grade, the recess opening shall be filled with Class D concrete. Prior to concrete placement, all existing concrete surfaces shall be primed with epoxy polysulfide grout. The grout shall be applied no sooner than two hours previous to the concrete placement. The uppermost surface of the concrete placement shall be finished as directed by the Engineer. The cost of this work, including grout placement, shall be included in the unit price bid for Class D concrete.

METHOD OF MEASUREMENT

Bridge expansion device will be measured by the linear foot between faces of curbs parallel to the pier, or other expansion element completely installed and accepted. Portions of devices required in faces of curbs including cover plates and hardware will not be measured for payment.

The words "completely installed" shall be interpreted to mean the joint system in place with the following operations completed:

1. Concrete placed and finished
2. Water-tight integrity test performed

BASIS OF PAYMENT

The accepted quantity of bridge expansion device will be paid for at the contract unit price per linear foot.

Payment will be made under:

Pay Item	Pay Unit
Bridge Expansion Device (0-9 Inch)	Linear Foot

Payment will be full compensation for all work necessary to complete the items, including furnishing and installing modular expansion device, steel angles, steel anchors, galvanized cover plates and hardware, bolts, inserts, epoxy grout, sealant, and any miscellaneous hardware required.

No payment will be made for any work noted to be done at the expense of the Contractor, or any work noted to be paid for under other items of the Contract.

April 10, 1986

REVISION OF SECTION 601
PERMANENT STEEL BRIDGE DECK FORMS
COLORADO PROJECT NO. IR 25-2(187)

Section 601 of the Standard Specifications is hereby revised for this project as follows:

Subsection 601.10(a) shall include the following:

"Permanent steel bridge deck forms will be required over all the Burlington Northern Railroad."

"All cost of additional material and labor required to use these forms shall be borne by the Contractor."

Delete subsection 601.10(c)5 and replace with the following:

"The form flutes shall be placed parallel to transverse reinforcing steel as shown on the plans."

June 5, 1986

REVISION OF SECTION 601
STRUCTURAL CONCRETE (COATING)
COLORADO PROJECT NO. IR 25-2(187)

Section 601 of the Standard Specifications is hereby revised for this project as follows:

DESCRIPTION

The work shall consist of furnishing and applying a bonding agent and two coats of a semi-opaque pure acrylic water repellent and colored coating to all designated concrete surfaces in accordance with the plans and these specifications.

MATERIALS

The bonding agent shall be formulated of acrylic polymers and modifiers designed to improve adhesion to the concrete.

The coating shall be semi-opaque colored toner containing only methyl methacrylate ethyl acrylate copolymer resins. The toning pigments shall be suspended in solution at all times by a chemical suspension agent, and solvent. The toning pigments shall be laminar silicates, titanium dioxide and inorganic oxides. There shall be no settling or color variation. Use of vegetable or marine oils, paraffin materials, stearates or organic pigments in any part of coating formulation will not be permitted.

Physical Properties

Weight per gallon	8.3 pounds, min.
Solids by weight	30% min.
Sand (Silica)	3.2 to 3.8 Lbs./Gallon

CONSTRUCTION REQUIREMENTS

The pre-bonding agent and the coatings shall be applied to all exposed concrete elements above the ground line and shall extend 1 foot below the ground line as shown on the plans.

The dark color mixture shall be No. 30117 and light color mixture shall be No. 30219 in accordance with Federal Standard 595a.

A 2-foot by 2-foot sample showing the required color and texture shall be prepared for initial approval. The coating shall be applied to a surface similar in pattern and texture to the concrete surface on the project. The samples must receive the Engineer's written approval before coating can be incorporated into the work.

REVISION OF SECTION 601
STRUCTURAL CONCRETE (COATING)
COLORADO PROJECT NO. IR 25-2(187)

All concrete finishing shall be completed in accordance with the specifications. Prior to application of the coating material all voids and irregularities shall be trued. Only minor voids which can be completely filled with the coating material may remain. Within 24 hours before the bonding agent is applied the cncrete surfaces to be coated shall be hot water blasted at a minimum of 3000 PSI followed by a cold water rinse to remove dirt, curing agents, form release agents, or other foreign substances that would be detrimental to the coating penetration or color. All surfaces to be coated must be clean, dry, and free of frost or other foreign substances at the time of application of the bonding agent. The first coating shall be applied to the area where the bonding agent has been applied as soon as possible, not to exceed 8 hours. The concrete shall be at least 14 days old before the bonding agent and coating may be applied.

The coating shall be mixed by a mechanical mixer, and must be applied by spraying. A roller will be used immediately folllowing the spray application to obtain texture and fill minor voids as approved by the Engineer.

The coating shall be applied uniformly in two coats. the approximate rates of application are 1 gallon per 60 square feet first coat and 1 gallon per 80 square feet second coat. The second coat shall not be applied less than 12 hours or more than 96 hours after application of the first coat. Workmanship shall be such that the final coated surface is colored uniformly, and presents a pleasing appearance.

The coating shall be applied only when the ambient temperature is between 40°F and 90°F.

Portions of retaining walls requiring a textured surface as shown on the plans will be coated as follows:

No sand (silica) will be used.
Use of a roller following the spray application will not be required.
Approximate rate of application is one gallon per 250 square feet per coat.

METHOD OF MEASUREMENT

The coating will not be measured and paid for separately but shall be included in the work.

April 10, 1986

REVISION OF SECTION 601
STRUCTURAL CONCRETE
COLORADO PROJECT NO. IR 25-2(187)

Section 601 of the Standard Specifications is hereby revised for this project as follows:

Subsection 601.07(e) shall include the following:

Bicycle path concrete shall be colored "Omaha Tan."

"Omaha Tan" colored concrete shall be colored with dye as follows:

One pound Davis Dye #5084 (Goldenrod) per sack of cement. Contractor shall submit a sample panel to the Engineer for approval prior to placing any concrete in order to effect a match as near as possible to the existing pavement.

Subsection 601.09 shall include the following:

For all walls requiring a textured finish, the form liners shall be properly aligned to eliminate visible horizontal and vertical joints in the concrete between pieces of form liners. A continuous pattern in the concrete shall be developed between pieces of form liners. The Contractor shall furnish one or more samples measuring three feet by three feet depicting the proposed surface treatment for approval. The contractor must receive the Engineer's written approval of a sample before the pattern can be incorporated into the work under this contract.

All work shall be pleasing to the eye, as determined by the Engineer.

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

April 10, 1986

REVISION OF SECTION 606
BRIDGE RAIL
TYPE 4 & TYPE 4 (SPECIAL)
COLORADO PROJECT NO. IR 25-2(187)

Section 606 of the Standard Specificaitons is hereby revised for this project as follows:

Subsection 606.01 shall include the following:

This work shall consist of the construction of bridge rail in accordance with these specifications and in reasonably close conformity with the dimensions and details shown on the plans or established.

The construction of the various types of bridge rail shall include the assembly and erection of all component parts and materials complete at the locations shown on the plans or as directed.

The types of bridge rail are designated as follows:

Bridge Rail Type 4
Bridge Rail Type 4 (Special)

Subsection 606.02 shall include the following:

Concrete shall conform to the requirements of Section 601. Reinforcing steel shall conform to the requirements of Section 602.

In Subsection 606.04 delete the first, fifth and last paragraphs and replace with the following:

Concrete barrier shall be constructed as shown on the plans.

Concrete finish shall be in accordance with Subsection 601.14. Class 1 finish shall be the final finish for all top inside and outside surfaces of concrete barriers, followed by application of a colored acrylic coating, in accordance with Revision of Section 601 Structure Concete (Coating).

Drill holes may be required in existing concrete to accommodate dowel bars. Dowel bars, as shown on plans, shall be grouted with approved epoxy grout.

Subsection 606.05 shall include the following:

Bridge rail shall be measured by the linear foot along the centerline of the rail from end-to-end of completed and accepted rail as shown on the plans. Concrete, and reinforcing steel will not be paid for separately, but shall be included in the bid prices for the Bridge Rail.

REVISION OF SECTION 606
BRIDGE RAIL
TYPE 4 & TYPE 4 (SPECIAL)
COLORADO PROJECT NO. IR 25-2(187)

Subsection 606.06 shall include the following:

The accepted quantities of bridge rail will be paid for at the contract unit price for the type specified.

Payment will be made under:

Pay Item	Pay Unit
Bridge Rail Type 4	Linear Foot
Bridge Rail Type 4 (Special)	Linear Foot

April 10, 1986

REVISION OF SECTION 607
FENCE (TEMPORARY)
COLORADO PROJECT NO. IR 25-2(187)

Section 607 is hereby revised for this project as follows:

Subsection 607.01 shall include the following:

This work shall consist of furnishing, installing, resetting, and removing temporary fence to restrict pedestrian access to the work area as required.

Subsection 607.02 shall include the following:

Temporary Fencing shall be orange colored plastic mesh fence fabric, at least 36 inches in height.

Subsection 607.03 shall include the following:

Temporary Fence shall be placed along the bike path and in other areas as required to limit pedestrian access to the project, as directed by the Engineer. Posts shall be no more than 25 feet apart, or as required.

Subsection 607.04 shall include the following:

Temporary Fence will be measured by the lineal foot. Posts will not be measured separately, but shall be included in the work.

Subsection 607.05 shall include the following:

The accepted quantity of temporary fence will be paid for at the contract unit price per linear foot.

Payment will be made under:

Pay Item	Pay Unit
Fence (Temporary)	Linear Foot

Payment shall be full compensation for furnishing, erecting, maintaining, resetting, removing, and disposing of all materials required for temporary fencing. Temporary fencing shall remain the property of the Contractor.

April 10, 1986

REVISION OF SECTION 613
HIGH-MAST LIGHTING
COLORADO PROJECT NO. IR 25-2(187)

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

DESCRIPTION

This work shall consist of furnishing, installing, and testing a complete high-mast lighting system comprised of foundations, high-mast weathering steel lighting standards with mast head assembly and lowering device, an electrical control and distribution system and all incidentals for high-mast lighting in accordance with these specifications and in reasonably close conformity with the details, lines, grades, and locations shown on the plans or established. Mast head assembly shall include luminaires and lamps. Electrical control and distribution system shall include all conduit, pull boxes, lighting control center, and electrical cables.

MATERIALS

Before ordering any materials, the Contractor shall submit 3 copies of a complete list of all the equipment and materials which he intends to install to the Engineer for approval. This list shall include, but is not limited to, the following:

Light standards, anchor bolts, lowering device, and luminaire mountings;
Luminaires, lamps, and ballasts;
Cables, splicing, and termination devices;
Conduits, conduit bands and splices, and electrical bushings;
Fuseholders, buses, and cable disconnect devices;
Control equipment, breakers, switches, contractors, relays, enclosures, lightning arresters, etc.;
Pull boxes;
Wiring and connection diagrams of all cabinets, circuits, fixtures, luminaires, etc.

The list shall include the brand name, any identifying numbers, relevant technical data, and any other information necessary for the agency responsible for maintenance of the system to procure exact replacements of any and all equipment and material used on the project.

The Contractor shall also furnish three copies of all Certificates of Compliance supplied by the manufacturer of the equipment to the Engineer. This equipment shall include, but is not limited to, the following:

Luminaire support and lowering system
High-mast light standards
Electric wire and cable
Circuit breakers and lighting control panel

Photo-electric cells
Luminaires and ballasts
Ground rods
Cast iron frames and covers for pull boxes
Anchor bolts
Photometric data
Conduit
Wire

Concrete

Concrete shall be Class "A" and shall conform to the requirements of Section 601 of the Standard Specifications. Class "AX" will be permitted.

Reinforcing Steel

Reinforcing steel shall conform to Section 602 of the Standard Specifications.

Grounding

A grounding electrode shall be installed at each high-mast lighting standard. The electrode shall consist of either two 8' x 5/8" driven ground rods or a metal plate with a minimum surface area of 2 sq. ft. located near the bottom of the caisson. The grounding electrode conductor shall be a minimum of #6 AWG Bare solid copper. This conductor, the neutral conductor (if present), the grounding conductor, the metal case of the mast shall be electrically connected together as required by the National Electrical Code. Exposed metal parts of the luminaire support system shall be electrically connected to the grounding conductor of the portable cable.

Conduit

Rigid Conduit shall be galvanized rigid steel conforming to the latest edition of Underwriters Laboratories "Standards for Safety" UL 6. Conduit shall be furnished in suitable lengths and each length shall be clearly and durably marked at least every ten feet with the Underwriters Laboratories label. Galvanized rigid steel conduit shall have a minimum zinc coating thickness of 0.008 inch.

Plastic Conduit shall conform to subsection 715.06 of the Standard Specifications.

Where flexible metal conduit is allowed, it shall conform to the latest edition of Underwriters Laboratories "Standards for Safety" UL 1.

REVISION OF SECTION 613
HIGH-MAST LIGHTING
COLORADO PROJECT NO. IR 25-2(187)

Street Lighting Cable--General

The Portable Cable furnished for the High-Mast Light Standard Circuit shall consist of three flexible copper conductors and a flexible grounding conductor, individually insulated for 600 volts, and shall maintain flexibility at ambient temperatures. Each conductor shall have a minimum of 100 strands. The cable shall comply with all applicable sections of Article 620 of the National Electrical Code, and to Insulated Power Cable Engineers Association Specifications S-19-81, Section 7.6.

The electrical cable shall be furnished in suitable lengths as shown. Each length shall be clearly and durably marked with the UL label, type of insulation, number of conductors, and the AWG size.

The conductors shall be of the sizes shown below:

Cable Use	Conductor	Street Lighting Cable Type
High-Mast Feeder Circuits	4/0 AWG Copper Triplex Suitable for Direct Burial	Direct Burial or Conductors in Conduit
High-mast Light Standard Circuit (Portable Cable)	6 Copper	Subsidiary

The Contractor shall furnish the exact description of the cable he proposes to use. Street lighting cable for High-Mast Feeder Circuits shall be of 600 volt AC construction and suitable for installation in underground ducts.

Street Lighting Feeder Cable (Direct Burial)

The cable for direct earth burial shall conform to these requirements: It shall consist of three conductors of stranded 4/0 AWG Copper Triplex, High Molecular Weight Polyethylene/High Density Polyethylene (HMWPE/HDPE) insulated cable suitable for 600 volt operation and direct earth burial. Cable shall conform to the applicable sections of the IPCEA Publication No. S-19-81 (5th Ed.). The insulation shall conform to the Requirements of Interim Standard #2 to IPCEA Publication No. S-66-524.

The Contractor will be permitted to substitute 3" conduit and feeder cable, in locations requiring bends or elbows, as described in the following paragraph in lieu of direct burial cable at no change in contract unit prices.

REVISION OF SECTION 613
HIGH-MAST LIGHTING
COLORADO PROJECT NO. IR 25-2(187)

Street Lighting Feeder Cable (In Conduit)

The cable for installation in conduit shall conform to these requirements: It shall consist of three conductors of stranded 4/0 AWG Copper Triplex cross-linked polyethylene insulated cable suitable for 600 volt operation. Cable shall conform to the applicable sections of the IPCEA Publication No. S-19-81 (5th Ed.). The insulation shall conform to the Requirements of Interim Standard #2 to IPCEA Publication No. S-66-52A.

Structural Steel

All structural steel furnished, except as otherwise specified in the plans or required to be galvanized, shall conform to the requirements of AASHTO M-222 or other weathering steel having equivalent corrosion resistance to AASHTO M-222. Structural Steel greater than 1/2 inch in thickness and used for primary members shall meet the notch-toughness requirements of Charpy-V-notch test at 15 ft. -1 lbs. at +40°F.

These steel superstructures will not be painted. The properly cleaned steel surfaces will be left exposed to the elements.

After fabrication is complete, the exterior surfaces of all light standards and accessories shall be blast cleaned to the finish commonly known as commercial blast cleaned surface. Such blast cleaning shall remove all rusts, mill scale, paint, and other markings, dirt and all foreign materials, and shall leave a uniformly cleaned, bare metal surface with only slight shadows, steaks, and discolorations from rush and mill scale oxides remaining. Grease, oil, and paint shall first be removed by suitable solvents.

These blast cleaned surfaces shall be protected against contamination by oil, grease, paint, crayon, chalk, or other markings during transportation, storage and erection, and concrete placement. These surfaces shall present a uniform surface appearance in the completed structure and shall be free of any substance which will affect the natural oxidation of the steel.

Oil and grease shall be removed by suitable solvents. Dirts, mortar leaks, and spatters, and other foreign substances shall be removed by apropriate methods. Washing with clean water is considered an acceptable cleaning method. A non-uniform appearance of these surfaces due to contamination by oil, grease, or paint after the shot blast cleaning may require field blast cleaning after erection.

All galvanizing shall be performed in accordance with the requirements of ASTM A 123. Any areas where galvanized coating has been disturbed due to handling or transporting shall be painted with one full brush coat of zinc

rich paint meeting Military Specification MIL-P-21035. It is required that the longitudinal welding along the light standard and the welding of the end attachments made during fabrication shall be performed prior to galvanizing.

The light standard and its accessories must be manufactured of material of like appearance. It will not be required that the light standard cap, luminaire assembly, and its accessories necessarily match those of the light standard and its accessories, if approved by the Engineer.

All miscellaneous bolts shall meet the requirements of ASTM A 325. All nuts, bolts, and washers supplied which are not galvanized shall have chemical properties of ASTM A 325, Type III.

All anchor bolts shall be fabricated from steel as specified by the manufacturer and that portion of the anchor bolts and nuts which will be exposed above foundation shall be galvanized in accordance with ASTM A 123.

High-Mast Light Standards

All structural components of light standards, bases, anchor bolts, luminaires, and other attachments to be used for high-mast lighting shall be designed for a minimum of 100 MPH wind velocity, in accordance with the current edition of the "Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals," as published by the American Association of State Highway and Transportation Officials, except as provided herein.

The wind velocity (V) used in determination of the wind pressure (p) given by the formula $p = 0.00256\ (1.3v)^2 C_s C_h$ shall be 100 MPH. Detailed computations are required and shall show the values used for the C_h and C_s factors in determining the wind pressure.

The wind load shall be applied to all areas seen in normal elevation.

A detailed stress analysis of the light standard shall be furnished.

Light standards shall be constructed of a tapered shaft of either circular or many-sided construction of length as described in the plans. The shaft may be furnished as a single welded unit or in the telescoping sections. The sections shall be cold-formed. The shaft shall taper uniformly from top to bottom.

If the shaft is furnished in telescoping sections, the number of sections shall not exceed five (5) for shafts 120 ft. or less and shall not exceed six (6) for shafts up to and including 150 ft. Each shaft section shall be fabricated so that it may be telescoped over the next lower section a

minimum of 1-1/2 times the diameter of the female and at the joined sections with a firm tapered fit. The sections shall be a minimum 10' length, prefitted, and match-marked at the factory. In the field, the sections shall be mechanically telescoped in a manner recommended by the manufacturer and approved by the Engineer. No additional settlement after the first 24 hours from installation exceeding 1/8 inch shall take place. No field welds shall be permitted.

If a single welded unit shaft is furnished and, because of hauling restrictions, the shaft cannot be shop fabricated in one piece, a field weld will be allowed. This field welding shall be done by AWS certified welders working for and under the direct supervision of the pole manufacturer.

The shaft of single unit poles shall be welded with backed up 100% penetration circumferential transverse welds. All circumferential transverse welds, except the base plate connection, shall be ground flush (+1/32", -0"). Back up meterial must be contoured for full contact, continuous, and of the same material as the shaft.

Each shaft may have a maximum of two longitudinal electric welds with 60 percent minimum penetration. The weld shall have a smooth, uniform appearance.

Certified mill test reports shall be submitted before shop fabrication work begins.

The contractor shall furnish 6 sets of shop drawings of the complete light standard assemblies to the Division, along with certification that all materials used in the fabrication are in accordance with this specification.

Approval of shop drawings by the Division will not relieve the Contractor of responsibility for correctness of dimensions or for other errors, but rather constitutes acceptance by the Engineer of the construction and fabrication methods being proposed by the fabricator.

The service hand hole shown on the plans shall be so constructed that its location shall not interfere with the operation of the lowering assembly and shall be reinforced to maintain the full strength of the light standard.

A grounding nut, sized to accommodate a #1/0 AWG stranded copper conductor, shall be located internally at the light standard base and within easy access of the service hand hole.

A Service Portal and cover shall be located as shown on the plans and will be constructed to min. size of 10" x 20" or larger. The light standard

shall be reinforced to maintain full light standard strength in the area of the portal.

Base plate and anchor bolts shall be as specified by the light standard manufacturer. The manufacturer shall furnish a notarized certificate stating that the bolts are of adequate strength to resist the loading required in these special provisions.

Each anchor bolt shall come complete with a minimum of three galvanized hex nuts, or approved equal, of the appropriate size. The anchor bolts shall be threaded and the threaded portion shall be galvanized to a length that will ensure that any part of the bolt left exposed shall not be without galvanizing. Threads shall be full and sound, Type UNC. All galvanizing shall be in accordance with ASTM A 123. The anchor bolts shall be of sufficient length to develop the full strength of the bolt. Hooks or anchor plates may be provided to engage sufficient concrete mass to fully develop the anchor bolts.

Luminaire Supports and Lowering Device

A part of each high-mast tower will be a luminaire support and lowering assembly as shown in the plans. Steel shapes, plates and pipe shall conform to the designations shown in the plans and shall be constructed of steel meeting the requirements for Structural Steel in these specifications or for steel meeting the requirements of ASTM A 36. If steel meeting the requirements of ASTM A 36 is used, the support and assembly shall be galvanized in accordance with ASTM A 123. The light standard cap, luminaire support, and lowering assembly do not necessarily need to be constructed of the same material as the light standard.

The basic requirements for the luminaire supports and lowering device are as follows:

1. The luminaire supports shall be capable of supporting the indicated loads and loading conditions as previously stated in these special provisions.

2. The electrical contacts shall be located at the base of the light standard.

3. The Contractor shall recruit the services of the manufacturer's representative to assist in the proper installation of the lowering device.

REVISION OF SECTION 613
HIGH-MAST LIGHTING
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4. The system shall be so designed and constructed to ensure that the luminaire support ring, when in fixed position, will be held firmly in place. This shall be accomplished by providing necessary parts in the system to compensate for wear or minor deformation of component parts which will occur during the normal course of their use.

The following is only one method of constructing the lowering device and is outlined in the plans and these special provisions for the bidder's information.

The Luminaire Support Assembly shall be constructed as shown on the plans or as approved by the Engineer and shall consist of a head frame of structural steel attached to the light standard shaft by sleeving and secured by four set screws. Head frame shall provide three point suspension for the Luminaire ring. Head frame shall encompass six four-inch hoisting cable sheaves grooved to the exact cable diameter for 180° cable bearing surface and shall be bushed with oil-impregnated, sintered bronze busing over the stainless steel shafts. Three 3/16 inch stainless steel aircraft cables shall be included. A large cast aluminum power cable sheave with a diameter equal to the radius of the luminaire ring shall be provided. This sheave shall be bushed with oil impregnated sintered bronze bushings over a stainless steel shaft. A single power cable with suitable conductor quality and size for proper operation and suitable for damp locations shall be included. The head frame shall also include three latching devices to support the luminaire ring assembly when the lowering device is not in operation.

When the ring is in the lock position, there shall not be tension in the three cables. These latches shall be actuated by alternate raising and lowering of the hoisting cables and have a visual indication, visible from the ground, that the luminaire support ring is latched securely.

All moving parts of the latch mechanism are to be attached to the luminaire ring and are to be serviceable from the ground. The head frame shall not contain any moving latch part. Latching mechanism shall not be impaired by formation of ice and shall not require adjustment. Head frame and latch assembly shall be in a weathertight enclosure.

Luminaire ring shall be constructed of structural steel with two-inch nominal steel pipe mounting arms. Entire luminaire ring shall be prewired to distribute power to separate luminaires from main supply cable. A three-prong twist lock receptacle shall be provided on the luminaire ring to allow testing of luminaires while in a lowered position. A neoprene bushed power cable support shall be provided to hold the power cable in the luminaire ring.

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Three two-point roller contact spring-loaded centering arms shall be provided to prevent jamming at any point on the light standard.

The winch shall be a self-locking, worm-gear-type. Winch shall be designed for hand operation and for operation by means of a 1/2" or larger heavy duty reversing electric drill motor. One-fourth inch stainless steel aircraft cable shall be supplied on the winch. The clevis and power cable support shall compensate for variations in the length of the three 3/16" hoisting cables by means of three compressing springs. A neoprene bushed cable support shall be provided to secure the power cable to the clevis. Ultimate support of the luminaire ring shall not be sacrificed by individual or total spring failure.

High-Mast Luminaire

The luminaire shall be of the latest type design and have the approval of the Engineer prior to ordering.

Luminaires shall have a precision cast aluminum, raintight housing with an adjustable slipfitter for use with a two-inch horizontal pipe, which will permit a 3° +/- adjustment above and below bracket axis.

Luminaires shall have an adjustable lamp socket assembly designed to accommodate a 1,000-watt High Pressure Sodum Lamp. This assembly shall be constructed to allow adjustment of the light center to provide control over the angle of maximum candle power. The lamp socket should be designed to hold the lamp secure and to minimize lamp damage due to vibrations.

The luminaire assemblies shall be constructed to allow "breathing" during the time of energizing and de-energizing of the lamp.

Ballasts shall be enclosed in a raintight cast aluminum housing constructed for direct mounting to the luminaire and serviceable without removing the luminaire from its bracket. Ballasts shall be of the auto-regulator type specifically manufactured for use with high-pressure sodium lamps, and shall operate at a minimum of 90% power factor. Operation shall be suitable with a line voltage variation of +/- 10%. Satisfactory starting operation shall be obtained with an ambient temperature of -20°F.

The Contractor shall submit a luminaire and ballast assembly complete with lamp and optical components for visual inspection and possible operational testing. Upon approval or rejection, the assembly may be picked up by the Contractor for disposal at his discretion. This requirement is in addition to photometric data and certifications.

Certified photometric data shall be submitted for the luminaires proposed for use on this project for approval prior to installation.

Luminaires shall be furnished complete with ballast and lamp. The lamp shall be a 1,000 watt High Pressure Sodium Type providing 140,000 initial lumens. The lamp shall be rated for an average life of at least 24,000 hours, during which time the lumen output does not fall below 70 percent of the initial output. Supply voltage is to be 120 volts.

High-Mast Luminaire, Symmetric Distribution

The reflector and/or refractor assembly shall be such as to create an IES Type V light distribution pattern. This assembly will be so designed that maximum candle power is emitted at approximately 60° beam nadir. The initial emitted intensity, occurring at approximately 60° beam nadir, shall be a minimum of 22,000 cp. A minimum of 45% of the total lamp lumins shall be emitted in a 0° to 60° zone, measured from beam nadir. Certified photometric data shall be submitted for the above mentioned requirements prior to approval.

Lighting Control Center

The housing for the lighting control center shall be of a manufactured type, cleancut in design and appearance, and of the approximate size and dimensions shown in the plans. The housing shall be factory painted green and shall be equipped with a 3 point catch and lock. These locks shall be furnished with two keys for each box, and all locks will be master keyed. When final acceptance of the project is made, the Engineer will distribute the keys to the agencies responsible for maintenance of the system. Housing shall be weatherproof and conform to the requirements of these Special Provisions and the plans, and shall be approved by the Engineer.

The housing shall be designed to house all required switching equipment. All necessary racks and equipment for mounting the required equipment shall be furnished by the Contractor.

Circuit breakers shall be used in lieu of fuses and shall be of the sizes shown in the plans. Each circuit shall have its own breakers and a fault on one circuit shall not affect the operation of any other circuit. The selector switch shall be a three position, key-operated switch with legend marked "Hand-Off Auto". Two keys shall be furnished with each switch. The contactor shall be used for switching the current to the lamps. Its contracts shall be capable of handling the load at 600 volts AC without undue pitting or burning of the contacts. The coil shall be capable of operating continuously. Contact material shall be design for lighting ballast loads, and to require no maintenance, such as filing, burnishing, or dressing, at any time the contactor is in service. The cabinet housing the

contactor shall contain apermanent instruction which states that, "Contacts shall not be filed, burnished, or dressed".

The photoelectric control shall be of weatherproof construction and be mounted as shown on the plans. Photo cells shall be of the cadmium sulphide type, providing an operating range of 1.0 to 5.0 foot candles. The unit shall operate at temperatures of -40° to +120°F. It shall include a built-in lightining arrestor and be equipped to mount in a standard 3-prong twist-lock receptacle. The photo-cell will be mounted by the Contractor on the cabinet. Necessary wiring and hardware required for mounting and connections shall be furnished by the Contractor. The photocell shall be shielded, where required, to prevent artificial light from interfering with its normal operation. If necessary, a control transformer may be used to convert the line voltage to lower voltage to operate the controls.

General

The installation shall be in accordance with the applicable sections of the National Electrical Code, all governing local ordinances and regulations, the plans, these special provisions, and those sections of the Standard Specifications which apply. All workmanship shall be first class and finished work shall present a neat, uncluttered appearance. The Contractor shall coordinate his work with other construction phases so as to provide a minimum of interference to the combined operations.

The Contractor shall make his own arrangements with the utility company regarding installation of conduit and cables supplying the lighting control centers. It shall be the responsibility of the Contractor to give adequate notice regarding the scope and power requirements to the power company and to arrange for all necessary electrical services. The Contractor shall notify PSCO when the system has been energized.

The locations of all services are shown on the plans and are subject to minor field revisions as may be determined by the utility company and the Engineer.

It shall be the Contractor's responsibility to replace and restore all surface materials in kind equal to or exceeding those disturbed by trenching, excavating or backfilling operations. This includes seeding, sodding, replacement of sub-base, pavement, trees, shrubs, etc. All excess materials shall be disposed of as directed by the Engineer.

Light Standard assemblies shall be fabricated and placed in accordance with the details and dimensions shown on the plans, or as directed by the

Engineer. The careful erection and aligning of the components furnished shall be considered a most essential feature of the installation and shall be as near to true vertical alignment as practical.

All circuits shall test clear of faults, grounds, and open circuits to the satisfaction of the Engineer.

After satisfactory completion of all tests required in these Special Provisions and by the Engineer, the illumination system shall be placed in operation. Final acceptance will not be made until the system has operated satisfactorily for a period of not less than 14 days.

Operation of the system shall not in any way be construed as an acceptance of the system or any part of it or as a waiver of any of the provision of the contract.

The Contractor shall be fully responsible for the system during this period of operation and he shall make any adjustment or repairs which may be required, and remedy any defects or damages which may occur, at his own expense.

The Contractor shall not be required to pay for electrical energy consumed by the system during the period of trial operation.

Tests

Prior to final acceptance, the Contractor shall demonstrate by test to the Engineer's satisfaction that all the electrical and lighting equipment installations are in proper condition per drawings and specifications. The Contractor shall furnish all equipment and appliance to make the tests.

Voltage and ampere reading shall be taken ahead of the contactor and below the contactor, and at the base of each tower with the entire system in operation.

The Engineer shall be notified at least two days prior to turning on the lighting system and the system shall not be put into operation before the Engineer or his authorized representative is present. All lighting circuits and equipment shall be given an initial operational test, consisting of having the entire system energized for 72 consecutive hours without any failures of any type occurring anywhere in the system. Additional tests to

certain segments of the system, or to any specific components of the system, shall be conducted as directed by the Engineer.

Cooperation with Utility Companies

The utility company will supply secondary power (metered, if necessary) to the points specified on the plans. The Contractor should contact the utility company to determine precise point of connection to the utility company equipment.

All apparatus and material used for the mounting of the control station, as shown on the plans, shall be furnished by the Contractor and upon acceptance of the project, will become the property of the contracting authority.

Control stations shall be furnished and installed as specified on the plans and approved by the designated utility company.

High-Mast Foundation (Drilled Caisson)

The Contractor shall construct the caisson-type foundation at each location according to the details shown on the plans. Exact location and elevation of the top of the foundations will be staked by the Engineer.

All foundations shall be constructed to not less than the minimum dimensions shown on the plans. Forming of the top foot will be required. The size and number of conduit bends will be installed in each foundation as indicated in the plans. The caged anchor bolt assembly shall be placed in the foundation so that it remains plumb and with the projection set as specified by the pole manufacturer. Anchor bolts shall be "caged" in a manner specified by the manufacturer and approved by the Engineer. The bolt circle shall be centered over the foundation. The top elevation of the foundation shall be set accurately and leveled.

The foundation construction shall conform to Section 503, Drilled Caissons, of the Standard Specifications.

Any irregularities in the cylindrial surface of the uncased holes outside of the nominal diameter shall be filled with concrete at the Contractor's expense.

Three inch conduit will be installed as shown on the plans to accommodate the circuit feeder cable from a minimum depth of 30 inches to the light standard center before pouring concrete. A one-inch conduit shall be installed as shown to accommodate the grounding electrode conductor. Minor adjustments to conduit placement may be made to negotiate reinforcement bars

as deemed necessary by the Engineer. A bends in the conduit shall have a minimum 24" radius.

All soil removed from the foundations and not required for backfill shall be disposed of as directed by the Engineer.

High-Mast Light Standard Assembly

Light standards shall be installed as shown on the plans. The careful erection and aligning of the light standards to a plumb position shall be considered a most essential feature of the installation. The assembled lighting standard shall, under dead load and at equal ambient temperatures, be as near to true vertical alignment as practical. Adjustment shall be accomplished by use of levelingnuts, located on the anchor bolts below the base plate in accordance with instructions furnished by the light standard manufacturer.

After erection and alignment of the light standard, the crack between the foundation and the base plate shall be filled with grout. Installation of a drain sump shall be done at this time, incorporating the use of a 1" PVC conduit as directed by the Engineer. The end of this 1" conduit shall be fitted with a screen to keep foreign objects from entering the light standard base. While the grout is still fresh, a depression which shall serve as a sump for the drain pipe, will be made within the light standard base.

Luminaires and ballast assemblies shall be securely fastened to the two-inch mast arms located on the luminaire ring and each light shall be adjusted so as to hang vertically when erection is complete. The Contractor shall be responsible for the correct placement and alignment of the luminaires with respect to the roadway. To ensure this correct alignment, the Contractor shall procure the assistance of a representative of the manufacturer supplying the luminaires.

Care shall be taken to assure that wherever the electrical cable passes through any metal or pulley, a bushing or other approved method is used to protect the cable from abrasion.

All splices required for distribution of power from the portable cable to the individual ballasts shall be made in the junction box. Two (2) conductors shall be trained to each ballast from the splice made in the junction box. These conductors may be of a smaller size, but not smaller than #12 AWG or than cable required elsewhere within the system to facilitate their installation. The cable used may be in compliance with Article 402, "Fixture Wires" of the National Electrical Code.

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Each luminaire support assembly shall be equipped with an approved lightning arrestor and installed in an approved electrical manner. The "line leads" of the arrestor shall be spliced to the "hot" portable cable conductors within the junction box. The "ground lead" of the arrestor shall be connected to the ground conductor of the portable cable at which point a positive ground connection is made with the luminaire support assembly. This positive ground may be accomplished by the use of a grounding lug attached to the luminaire support, but not to the junction box. All splices and connections shall be internal to the system and not exposed to the elements. The arrestor furnished shall be securely attached to the junction box or luminaire support assembly and not allowed to "hang loose".

A fused switch or breaker shall be installed at the base of the light standard as shown in the plans and be of appropriate size. The switch shall be used to switch power on and off to the twist lock disconnect for the portable power cable and the receptacle for the lowering mechanism.

Electrical Cable Installation (Direct Burial)

Direct buiral cable of the size or type required shall be installed at locations shown in the plans. Cable shall be placed in trench without dragging or stretching. Cables shall be unreeled by moving the reel to prevent dragging the cable along the ground and shall be laid alongside the trench. Cables shall not be kinked or damaged during this operation. Prior to placing the cable in the trench, extreme care should be used to ensure that the cable will be placed a minimum of 36 inches below ground level unless otherwise shown on the plans or directed by the Engineer. The bottom of the trench shall be firm and without excessive dips or pockets. Sharp objects will not be allowed to project from walls or bottom of trench. After the trench is ready and the cables unreeled alongside, the cables shall be lifted section by section and placed in the trench.

All trenches shall be backfilled as soon as practicable after placing the cable, and extreme care shall be exercised in compacting to prevent damage to the cable. The trench shall be backfilled and compacted to the density of the surrounding earth. The backfill material shall not contain any debris or foreign material.

Splices will not be allowed in search or in conduit proper. Splices or connections may be made only in handholes or junction boxes. All splices shall be made in accordance with the cable manufacturer's recommendations and standard electrical practices. Such splices and joints shall be waterproof and shall use connectors, tape, splicing compound, and other materials that are high grade and specifically intended for these purposes.

The cables shall be neatly trained to their destinations in cabinets, light standard bases, pull boxes, and all other terminations, and shall be clearly identified with its circuit by use of durable tags. These identification tags shall be attached to all intermediate points of a cable run within the pull boxes regardless of the presence of a splice. No "twist on" splices will be allowed.

The IPCEA recommended values for the minimum bending radii to which cables may be bent for permanent training during installation shall be adhered to. These limits do not apply to conduit bends, sheaves, or other curved surfaces around which these cables may be pulled under tension while being installed. Larger radius bends are required for such conditions. The minimum bending radii for cables used on this project shall be four times the overall cable diameter. This figure is valid for all such cables under one-inch diameter. Should larger cables be used, consult IPCEA data or consult with the Engineer.

Where direct burial cable passes under the roadway or into pull boxes, light standard foundations, or control centers, the cable shall be pulled into the conduit in an approved manner. The Contractor shall furnish, at the request of the Engineer, at least two copies of the manufacturer's recommendations, including methods of attaching pull wire, pulling tension per conductor size and per radius or conduit bends, and the type of lubricant to be used. If at all possible, the cable shall be pulled through the conduit by hand.

Conduit

The routing of conduit as shown on the plans indicates, in most cases, the general location and direction of the conduit runs. If, due to field conditions encountered during construction, it is necessary to depart substantially from the routing shown, the Engineer shall determine the new location in the field. The number of additional bends in such a run must be kept to a minimum and conform to the requirements of the National Electric Code and in all cases it shall be possible to install the cables without damage. In some cases it may be necessary to install additional pull boxes to facilitate proper cable installation.

The conduit shall be installed in suitable trenches with a minimum depth of 30 inches unless indicated otherwise in the plans or by the Engineer. The bottom of the trench shall be firm and without excessive dips or pockets. The conduit shall be installed in the trench and shall be handled in such a manner to eliminate damage to the conduit. All joints and terminations shall be made in accordance with the manufacturer's instructions and good practice. Joints shall be watertight and mechanically sound. Bushings, etc., shall be used at all terminations. Sharp edges, corners, or burrs that could in any way cause damage to the cables will not be permitted to

remain. The trench shall be backfilled and compacted to the density of the surrounding earth. The Contractor shall exercise all necessary caution to ensure that the conduit is not damaged in any way by foreign objects in the backfill or by the compacting process. The conduit shall not contain any debris or other foreign matter.

When directed by the Engineer, conduit under roadway shall be jacked under existing roadways. Only rigid steel conduit shall be permitted for use as conduit under any roadway.

All surface materials distributed by trenching and backfilling operations shall be replaced and restored in kind, equal to or exceeding the original condition. This includes seeding, sodding, replacement of sub-base and pavement, etc. All excess materials shall be disposed of as directed by the Engineer.

All burrs and sharp edges shall be reamed and smoothed so as not to cause damage to the cables. As far as possible, factory made bends and sweeps shall be used. Conduit may be field bent to fit certain installation requirements. All field bends shall be made using proper tools and equipment specifically designed and intended for these purposes. Bends shall be made in such manner as to eliminate excessive stresses and reduction of cross-sectional area. The radius of conduit bends shall be as great as possible due to the limitations encountered in cable installation.

Metallic Surfaces

Any surfaces, except cast iron, galvanized, ASTM-A588 steel, luminaires, ballasts, and lighting control centers, shall be finish painted in accordance with subsection 609.33 of the Standard Specifications, unless otherwise specified, with the following addition: "The first or shop coat shall be red lead paint followed by two additional coats of a color matching the 'weathered' steel. The Contractor shall obtain approval from the Engineer prior to applying these two finishing coats on the color he proposes to use".

Welding

Welding shall be in accordance with the latest edition of AWS Specification D1.1 and the AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals.

Weld Inspection

All transverse butt welds and the weld connecting the pole to the base plate shall be inspected by the Division by ultrasonic or radiographic methods.

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Portable Power Units

A portable electric 1/2" or larger heavy duty reversing drill motor will be required as part of this lighting installation, when called for on plans. It shall be equipped with a torque limiter and be remote controlled.

METHOD OF MEASUREMENT

The quantities to be measured under this Section shall be the actual number of Pay Units, completed and accepted, of the various Pay Items which appear in the bid schedule comprising the high-mast lighting.

Each of the Pay Items shall include the related fittings, mechanical and electric devices, wiring, and all other appurtenances necessary to complete the item.

High-mast foundations (drilled caisson) including anchor bolts will be measured by the linear foot as shown on the plans. The unit price shall include drilling, concrete, and reinforcing steel, as shown on the plans.

BASIS OF PAYMENT

Subsection 613.11 shall include the following:

Pay Item	Pay Unit
Luminaire High Pressure Sodium (140,000 Lumen)	Each
Light Standard Steel High Mast (130 Foot)	Each
High Mast Foundation (Drilled Caisson) (48 Inch)	Lin. Ft.
Lowering Device	Each
Lighting Control Center	Each
Light Standard Steel High Mast (100 Foot)	Each
Portable Power Unit	Each

April 10, 1986

REVISION OF SECTION 614
UNIFORMED TRAFFIC CONTROL AND TRAFFIC CONTROL VEHICLE
COLORADO PROJECT NUMBER IR 25-2(187)

Section 614 of the Standard Specifications is hereby revised for this project to include the following:

CONSTRUCTION REQUIREMENTS

Uniformed Officers. The Contractor shall employ off duty Denver Police officers to provide traffic control and traffic enforcement throughout the project as required. Arrangements for officers shall be made at least twenty-four (24) hours in advance by contacting Sgt. Smith of the off duty employment bureau at 575-3636.

Traffic Control Vehicles. The Contractor shall furnish full sized, late model, white sedans to be used by uniformed, off duty officers in the performance of traffic control duties.

The Contractor shall be responsible for licensing, insuring, fueling, and servicing, and shall maintain the vehicles in excellent mechanical condition at all times.

Radios. The Division of Highways shall furnish Motorola MT-500 slimline walkie talkie radios with eight (8) channel capability and basic Denver Police 1 through 5 channels. Each radio includes a desk top charging unit. Radios are provided for the exclusive use of uniformed officers while performing traffic control duties on the project. The contractor shall be responsible for maintaining the radios and charging units in good operating condition at all times during the project.

Light Bars. Shall be provided by the Division of highways for each uniformed traffic control vehicle.

The light bars shall be mounted on traffic control vehicles by the Contractor, and shall be maintained in good operating condition at all times. The contractor shall be required to obtain a permit from the Denver Police Department for use of the light bar.

Radios, charging units, and light bars are the property of the Division of Highways and shall be returned free of damage and in good operating condition at the end of the project. Any damaged or inoperative equipment shall be replaced at the contractor's expense.

Method of Measurement

The quantity to be measured for Uniformed Traffic Control will be the total number of hours that Uniformed Traffic Control is actually used as authorized. The quantity to be measured for traffic control vehicle will be the total number actually used as authorized.

Basis of Payment

The accepted number of hours of Uniformed Traffic Control will be paid for at the contract unit price per hour. The accepted number of Traffic Control Vehicles will be paid for at the Contract Unit Price per each.

Payment will be made under:

Pay Item	Pay Unit
Uniformed Traffic Control	Hour
Traffic Control Vehicle	Each

June 5, 1986

REVISION OF SECTION 614
OVERHEAD SIGN STRUCTURE
COLORADO PROJECT NO. IR 25-2(187)

Section 614 of the Standard Specifications is hereby revised for this project as follows:

Subsection 614.02 shall include the following:

Sign bridge structures, cantilever structures, sign bridge cantilever structures, and butterfly structures shall be of a round or rectangular tube design. All overhead sign structures shall be designed with a maximum of three chord members and shall be designed to support the sign panel area shown on the plans. The design shall be in accordance with the AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals, including the maximum dead load deflection criteria. The design wind speed shall be 80 mph.

For steel sign structures all structural members, walkway grating brackets, and railing shall be painted Mocha Brown in accordance with Section 509 of the Standard Specifications.

Backing zees and the backside of signs panels mounted on overhead sign shall be painted Mocha Brown. All aluminum surfaces to be painted shall be prepared with a chemical conversion treatment as required in subsection 713.02.

Two copies of design calculations and five copies of fabrication drawings shall be submitted for review and approval prior to starting fabrication.

Structural steel shall be in conformance with AASHTO M-183 (ASTM A-36) or equivalent.

Materials certifications, including mill test reports, shall be submitted to the Engineer prior to erection of the sign structure.

The foundation type shall be as shown on the plans.

In subsection 614.09, seventh paragraph, delete the last sentence and replace with the following:

Electrical circuit for overhead sign light fixtures shall be 110-115 VAC, 15 amp., fused circuits. Not more than two light fixtures shall be wired on any circuit.

REVISION OF 614
OVERHEAD SIGN STRUCTURE
COLORADO PROJECT NO. IR 25-2(187)

Subsection 614.13, delete the first paragraph and replace with the following:

> **Overhead sign structures (sign bridge structures, sign bridge cantilever structures, cantilever structures, and butterfly structures) will be measured by the number of units of the various types and sizes installed and shall include structural frame members, mounting brackets, safety walkways, posts, and light fixtures including all electrical equipment as required.**
>
> **Footings will be measured by the type and number installed and shall include pedestals, excavation, and backfill.**

Subsection 614.14 shall include the following:

Pay Item	**Pay Unit**
Concrete Footing (Type) (Spread)	**Each**

April 10, 1986

REVISION OF SECTION 614
SIGNING
COLORADO PROJECT NO. IR 25-2(187)

Section 614 of the Standard Specifications is hereby revised for this project as follows:

Subsection 614.09 shall include the following:

Backing zees, wooden sign posts, and the backside of sign panels shall be painted mocha brown. All aluminum surfaces to be painted shall be prepared with a chemical conversion treatment as required in subsection 713.02.

REVISION OF SECTION 614
IMPACT ATTENUATORS
COLORADO PROJECT NO. IR 25-2(187)

Section 614 of the Standard Specifications is hereby revised for this project to include the following:

DESCRIPTION

This work shall consist of furnishing and constructing impact attenuators of the size and type shown on the plans at the locations shown on the plans and in accordance with these specifications.

MATERIALS

Impact attenuators shall be the Guard Rail Energy Absorption Terminal (G-R-E-AT System) and Hi-Dri Cell Sandwich Unit, as manufactured by Energy Absorption Systems, Inc., One East Wacker Drive, Chicago, Illinois 60601, or approved equals.

CONSTRUCTION REQUIREMENTS

The impact attenuators shall be installed according to the manufacturer's suggested method of installation. The Contractor shall submit to the Engineer for approval drawings showing the type of attentuator to be used and the method of installation to be implemented. Drawings shall be submitted as specified in Section 105 of the Standard Specification.

METHOD OF MEASUREMENT

Impact attenuators will be measured as a completed unit.

BASIS OF PAYMENT

The accepted quantity of impact attenuators will be paid for at the contract unit price per each, which price shall be full compensation for all materials, labor, tools, and equipment necessary to complete the work. Payment will be made under:

Pay Item	Pay Unit
Impact Attenuator (Guard Rail Energy Absorbing Terminal)	Each
Impact Attenuator (Sandwich System)	Each

Payment shall include site preparation; excavation; concrete pad, including rebar; HBP patching; all necessary hardware, including Lt. and Rt. side transition panels and extension panel accessory items; and providing full sets of replacement cartridges and extra universal nose wraps.

April 10, 1986

REVISION OF SECTION 627
PAVEMENT MARKING
COLORADO PROJECT NO. IR 25-2(187)

Section 627 of the Standard Specifications is hereby revised for this project as follows:

In subsection 627.08, delete the second paragraph and replace with the following:

> The surface of the pavement must be clean, free of loose foreign material; shall be dry and have had no moisture for a minimum of 48 hours prior to application of the markings.

Subsection 627.11 shall include the following:

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

April 10, 1986

REVISION OF SECTION 708
PAVEMENT PRIMERS
COLORADO PROJECT NO. IR 25-2(187)

Section 708 of the Standard Specifications is hereby revised for this project as follows:

Delete Subsection 708.07 Pavement Primers and replace with the following:

An epoxy resin primer shall be used on all roadway surfaces. The type and application rate will be as recommended by the thermoplastic and preformed plastic pavement marking manufacturer.

A zero primer application rate shall not be accepted except for thermoplastic markings placed on new asphalt surfaces as recommended by the manufacturer and approved by the Engineer in writing. However, should the new asphalt surfaces become soiled (as determined by the Engineer) prior to placement of the pavement markings, the use of pavement primer shall be required regardless of the manufacturer's recommendation.

The primer materials may be accepted at the job site on the basis of a manufacturer's certification, or they may be sent to the Material Laboratory for testing, in which case three (3) weeks should be allowed between sampling and intended use.

April 10, 1986

REVISION OF SECTION 715
FIBERGLASS-REINFORCED PLASTIC CONDUIT
COLORADO PROJECT NO IR 25-2(187)

Section 715 of the Standard Specifications is hereby revised for this project as follows:

Subsection 715.06 shall include the following:

Wherever the plans call for electrical conduit in the bridge structure, fiberglass-reinforced plastic conduit and fittings meeting the following requirements may be substituted for metal conduit at no change in the bid price for the conduit.

(a) Material - the conduit and fittings shall be manufactured from a thermosetting epoxy resin, reinforced with fiberglass, fabricated as follows:

(1) Straight lengths of conduit shall be made by helically winding epoxy-impregnated continuous glass filaments around a smooth mandrel, curing the epoxy, and then removing the mandrel. They shall have an expanded end integral coupling at one end.

(2) Bends shall be made by winding epoxy impregnated continuous glass filaments around a smooth mandrel, forming the bend on a jig and then curing the epoxy. Two types of bends shall be made, those with and those without integral couplings on both ends.

(3) Fiberglass-reinforced epoxy conduit-to-metal adaptors shall consist of a short length of straight, rigid fiberglass-reinforced epoxy conduit with a standard threaded metal conduit coupling attached to one end of the rigid duct by means of epoxy resin as used in the fabrication of the duct. When steel couplings are used, as for connections to rigid steel conduit, the couplings shall be hot dipped galvanized after threading.

Bell end fittings shall be molded and shall be fiberglass-reinforced.

(b) Coupling of the duct sections shall be accomplished by one of the following methods:

(1) Coupling of the duct sections may be accomplished and secured by mating a spigot end into an integral bell end, with a blow to the open end of the duct section if the ends are designed to

-continued-

provide a mechanically secure friction type joint. On sizes 2 inch in diameter and larger, the bell end shall have an integral polyurethane rubber seal on the inside to provide both a mechanically secure and watertight joint when the sections are thus mated. Additional sealer or cement shall not be necessary in normal applications.

(2) The duct sections may be assembled with threaded joints, if the enlarged (bell) end of the coupling and the spigot end are provided with tapered, doublelead threads.

(c) When subjected to compressive loads in accordance with test method ASTM D-2412, the conduit shall meet the following requirements:

Duct Size (Inches)	Weight Required for 5% Deflection of I.D. (Lbs./Ft. of Conduit)*
3/4	725
1	650
1-1/2	500
2	350
3	200
3-1/2	160
4	100

*No less than three specimens shall be tested for each sample of pipe. The average of three tests shall be equal to or greater than 95% of the value shown.

(d) The internal diameter of each finished bend and duct shall be such that a round ball shall pass freely through the bore of the bend or duct. The ball diameter shall be as follows:

-continued-

REVISION OF SECTION 715
FIBERGLASS-REINFORCED PLASTIC CONDUIT
COLORADO PROJECT NO IR 25-2(187)

MINIMUM DIAMETER OF BALL FOR CHECKING THE INTERNAL DIAMETER OF A FINISHED BEND AND CONDUIT

Trade Size Inches	Minimum Diameter of Ball For Checking Conduit Inches	Minimum Diameter of Ball For Checking Bends Inches
3/4	.70	.66
1	.93	.88
1-1/2	1.40	1.32
2	1.86	1.76
3	2.76	2.61
3-1/2	3.19	3.01
4	3.62	3.42

As an alternate to using a ball to check the bore of conduit and bends an inside micrometer gauge or telescopic gauge and a micrometer caliper may be used.

(e) The conduit shall meet the following physical property requirements:

Property	Test Method	Value
Water absorption, 24 hours at room temperature	ASTM D570	0.022% Maximum
Barcol Hardness	ASTM D2583	45-60
Specific Gravity	ASTM D792	1.9 Minimum
Inside Surface Finish	--------	125 Microinches or Less

(f) All conduit, fittings and bends shall bear the U.L. seal of approval and shall conform to Article 347 of the National Electrical Code.

April 10, 1986

FORCE ACCOUNT ITEMS
COLORADO PROJECT NO. IR 25-2(187)

DESCRIPTION

This provision consists of the Division's estimate for force account items included in the Contract. This work shall be performed as directed by the Engineer.

BASIS OF PAYMENT

Payment will be made in accordance with subsection 109.04. Payment will constitute full compensation for all work necessary to complete the item.

Force account work valued at $5,000.00 or less, that must be performed by a licensed journeyman in order to comply with Federal, State or local codes, may be paid for after receipt of an itemized statement endorsed by the Contractor.

FORCE ACCOUNT

F/A NO.	Pay Item	Quantity	Estimated Amount
F/A 01	Minor Contract Revisions	F.A.	$50,000
F/A 02	On-The-Job Trainee	5	$ 4,000
F/A 03	MBE Incentive Payment	F.A.	As Per Specification
F/A 04	Relocate Water Tap	F.A.	$ 980
F/A 05	Potholing for Utilities	F.A.	$ 2,000
F/A 06	Repair and Maintenance of Existing Irrigation System	F.A.	$ 5,000
F/A 07	Railroad Flagging	F.A.	$10,000

June 5, 1986

RAILROAD REQUIREMENTS (B.N. RR)

COLORADO PROJECT NO. IR 25-2(187)

I. GENERAL

This project includes construction work on the rights-of-way and/or properties of the Burlington Northern Railroad Company (hereinafter called "Railroad") and adjacent to the tracks, wire lines and other facilities of Railroad. That portion of this project involving a hazard to the Railroad due to the Contractor's operations is estimated to be 8 percent of the total project. The Division of Highways of the State of Colorado (hereinafter called "Division") does not guarantee the accuracy of this estimated percentage and assumes no responsibility or liability for losses incurred by the Contractor or any insurance underwriter in relying upon the accuracy of the estimate in any manner whatsoever. The Contractor and Subcontractors shall cooperate with the officers and the authorized representatives of the Railroad and its tenants to the end that the Contractor's work shall be begun, conducted and completed in such manner as to cause no interference whatsoever with the safety or the continuous and uninterrupted use and operation of the tracks, wire lines and other facilities belonging to the Railroad or its tenants.

For the benefit of the contractor and the Insuror(s) the current railroad traffic at the project area is estimated at 2 train movements per day, at maximum speeds of 10 M.P.H.

The plans for this project, affecting the Railroad, are subject to approval by the Railroad and changes in plans may be required after award of contract. Such changes are subject to the approval of the Division, FHWA and the Railroad.

Before commencing any work on Railroad's properties, the Contractor will notify:

Mr. E. M. Martin, Division Superintendent
Burlington Northern Railroad Company
3700 Globeville Road
Denver, Colorado 80216

All notices and correspondence with the Railroad shall contain the project number and location. Conforming copies of such notices and correspondence shall be submitted to the Division's Engineer.

Said notices to be given in writing at least ten (10) days in advance of the date on which the Contractor expects to begin such work.

-continued-

The Contractor shall comply with all rules and regulations prescribed by the Railroad, as to the proper manner of protecting the tracks (and the traffic moving thereon), telephone, telegraph and signal wires and other property of the Railroad or its tenants at and in the vicinity of the project during the time such work is being performed, and all costs for complying with such rules and regulations shall be borne by the Contractor. The Railroad shall assign to the Contractor flagmen for the protection of train operations. All costs for such flagmen shall be as provided in Section V herein.

The Contractor shall hold the Railroad harmless and indemnify it from and against any and all loss, damage, claims, demands, causes of action, cost and expenses of whatsoever nature arising out of damage to or destruction of property whatsoever, where such injury, death, damage or destruction results from any cause due to work done in connection with the construction of the project on or in close proximity to railroad property and shall also release the Railroad from and shall waive any claim for injury or damage to the work under construction or to the property which may result from the construction, maintenance and operation of railroad tracks, wire lines, pipe lines and other railroad facilities on said rights-of-way of the Railroad, SAVE AND EXCEPTING any death, damage or destruction resulting solely from the negligent acts or omissions of the Railroad, its officers, agents or employees.

II. RAILROAD INSURANCE

Policy or policies of Insurance, set forth in Special Provisions titled RAILROAD INSURANCE, shall be furnished to the Division's Staff Construction Engineer for transmittal to the Railroad.

If any part of the contract work on Railroad's properties is sublet, similar insurance shall be provided by or in behalf of each Subcontractor.

III. CONTRACT REQUIREMENTS

1. Construction materials or any other temporary obstruction shall not be placed closer than 10 feet from the centerline of track and 23 feet vertically above top of rail.

2. The Contractor shall not establish any work road crossings on Railroad's tracks or roadways or unloading pits on Railroad's right-of-way.

3. The Contractor and Railroad shall agree, in advance, upon methods and procedures covering all construction of Railroad's properties. When required by Railroad, such proposals shall be in writing.

-continued-

4. Upon completion of the work, the Contractor shall remove from the premises of Railroad's right-of-way all equipment, surplus material and debris, leaving such premises in a neat condition satisfactory to the Railroad.

IV. WORK TO BE DONE BY RAILROAD

1. Furnish personnel for protection and inspection services.

V. RAILROAD FLAGGING

The Contractor shall notify the Railroad in writing 72 hours prior to beginning and 48 hours prior to stopping any work which will require protective services.

It is estimated that one flagman will be required.

During the period of construction, all flagging and protective services shall be performed strictly in accordance with the directives and instructions issued by the Railroad. Contractor will confer with the Railroad for the times, locations and manner of such protective measures.

Flagging services will be performed by Sectionmen. The estimated pay rate for each flagman is $24 per hour for five 8-hour days with time and one-half for overtime, Saturdays, Sundays and holidays. Related costs included in the hourly rate covers vacation allowances, paid holidays, retirement and unemployment, public liability and property damage insurance, health and welfare and supervision. This rate is subject to any increases which may result from Railroad Employees-Railroad Management negotiations or which may be authorized by Federal authorities.

The Contractor shall be billed monthly by the Railroad at the current rates of pay for flagging services furnished and the Railroad shall be reimbursed by the Contractor within 30 days after receipt of bills.

For information, the estimated cost of flagging services for this project is $10,000 but is not limited to that figure. To the extent of the actual cost, the Division shall reimburse the Contractor for all approved flagging hereunder. The cost of flagging required subsequent to the contract time expiration date or any approved extension of time, shall be borne by the Contractor.

April 10, 1986

UTILITIES
COLORADO PROJECT NO. IR 25-2(187)

Known utilities within this project are:

Mountain Bell	Frank Romero	896-4773
Mountain Bell	Rich Wantuch	367-6015
Public Service Company--Electric	Vince Marker	571-3553
Public Service Company--Gas	Jim McQuiston	571-3744
Denver Wastewater Management	Bruce Leiser	295-1451
Metropolitan Denver Sewage Disposal	Gary Flesner	289-5941
Denver Water Department	Linn Unruh	623-2500

The work described in these plans and specifications will require full cooperation by the Contractor and the Utility companies in accordance with subsection 105.06 in conducting their respective operations so that utility work can be completed with minimum delay to all parties concerned.

The work listed below will be performed by the Contractor in accordance with the plans and specifications, and as directed by the Engineer. The work shall be subject to an inspection by the owners prior to acceptance.

FOR:

Public Service Company--Electric

Install large pull boxes and 4" conduit through the bridge structure for power source feed to proposed high mast lights. This installation to be done as contract items.

Irrigation Water Tap

Contact John Lippert in Water Sales at the Denver Water Department and apply to have the existing tap at 700 Vallejo Street be reassigned as a new 6" tap at the same address. The existing 30" line will then be abandoned and the new tap will serve for the proposed irrigation system in the interchange.

The application and tap fee will cost approximately $980.00 and shall be paid as a planned force account.

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

Public Service Company--Electric

Relocate existing aerial distribution lines along with taller poles at station 706+50 ± (Ramp F), and provide power sources for lighting and signing. Work is expected to be done prior to construction.

Relocate the existing street lights along the SW ramps to the detoured SW ramps. After the high mast lighting is installed, these lights shall be removed. Work is expected to be coordinated with construction.

Buried primary along SB I25 from 3rd Avenue South to be left in place under roadway widening to be constructed.

Mountain Bell

Abandon all telephone pedestals between 8th Avenue and Bayaud Avenue along SB I25.

Public Service Company--Gas

Extend 16" casing or perform maintenance work on line under existing I25 at 3rd Avenue (west side) to beyond future SB I25 widening.

Work expected to be done prior to construction.

Denver Water Department

Abandon 30" water line through interchange. Expected to be done when requested with one (1) month lead time.

General:

The Contractor shall contact underground locators (Blue Stakes at 534-6700), at least 48 hours prior to beginning excavation or grading in the area of electric lines, gas lines, and/or telephone lines.

The locations of utility facilities as shown on the plan and profile sheets, and herein described, were obtained from the best available information.

Full compensation for compliance and cooperation as required by this section shall be considered to be included in the prices paid for the various contract items of work, and no additional compensation will be allowed.

June 5, 1986

REVISION OF SECTION 602
EPOXY COATED REINFORCING STEEL
COLORADO PROJECT NO. IR 25-2(187)

Section 602 of the Standard Specifications and Section 602 of the Supplemental Specifications are hereby revised for this project as follows:

Subsection 602.03 shall include the following:

All accessories, including reinforcing steel supports, ties, and splicers used in conjunction with epoxy coated reinforcing steel, shall be plastic or epoxy coated.

The plan details for the superstructures of the bridge on this project call for some epoxy-coated reinforcing steel and some plain reinforcing steel. However <u>all</u> reinforcing steel in the following areas shall be epoxy-coated.

a) The entire superstructure consisting of the slab, all webs, all diaphragms (pier, abutment, and intermediate), wingwalls, bridge rails, and approach slabs.

b) The entire substructure consisting of the abutments, piers and footings.

c) All the reinforcing steel located within the retaining wall stem for all retaining walls.

June 13, 1983

REVISION OF SECTION 102
PREQUALIFICATION OF BIDDERS

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

In subsection 102.01, First paragraph, delete the second sentence and replace with the following:

> The confidential financial statement of bidders desiring to prequalify for projects $500,000 and over, must be audited by a certified public accountant and accompanied by an affidavit by the CPA.

March 22, 1984

REVISION OF SECTION 102
MATERIAL GUARANTY

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

Subsection 102.14 shall include the following:

All steel materials permanently incorporated into the project shall be produced or manufactured within the United States. The Contractor shall provide written certification to verify the domesticity of these materials.

This requirement will not prevent a minimal use of foreign steel provided the cost of such materials does not exceed one-tenth of one percent of the total contract cost, or $2,500 whichever is greater. The contractor shall provide documented evidence of the cost of all foreign steel, regardless of the amount, used on the project.

June 13, 1985

REVISION OF SECTIONS 103 AND 107
CONSIDERATION OF PROPOSALS

Sections 103 and 107 of the Standard Specifications are hereby revised for this project as follows:

Subsection 103.01 shall include the following:

> Prior to the award of the contract, the low responsible bidder shall submit a PERFORMANCE CAPABILITY STATEMENT (sample attached). The completed STATEMENT shall be submitted to the Award Officer prior to 4:30 P.M. on the 5th calendar day after the bid opening. Failure to submit the STATEMENT may result in the denial of award to the apparent low responsible bidder and forfeiture of the proposal guaranty.

In subsection 107.22, delete the next to last sentence and replace with the following:

> The original of the signed affidavit relative to collusion shall be submitted by the Contractor with the bid proposal. The bid proposal will be rejected and will not be read if it does not contain the signed affidavit.

Project No. _____

Date _____

PERFORMANCE CAPABILITY STATEMENT

I, acting in my capacity as officer of a bidder/bidders (if a joint venture) on this project request that I be allowed to remain in competition for the contract. I am submitting the following information to show my capability to perform on this project.

1. Identity of Partnerships or Joint Ventures on this project.

   a. _____

   b. _____

   c. _____

2. Identify any decreases in fiscal or workmanship qualifications compared to last prequalification submission to CDOH.

   List key personnel changes: _____

   _____

   List key equipment changes: _____

   _____

   List fiscal capability changes (Legal actions, etc.): _____

   _____

   Any other circumstances that may affect ability to perform on this project. _____

   _____

SAMPLE

NOTE: Write "None" if it appropriately answers any above listed item. If more space is needed for answers to the above listed items, attach additional sheets.

I DECLARE UNDER PENALTY OF PERJURY IN THE SECOND DEGREE, AND ANY OTHER APPLICABLE STATE OR FEDERAL LAWS, THAT THE STATEMENTS MADE ON THIS DOCUMENT ARE TRUE AND COMPLETE TO THE BEST OF MY KNOWLEDGE.

SIGNATURE: _____ DATE: _____

FIRM NAME: _____

August 21, 1985

REVISION OF SECTION 104
SCOPE OF WORK

Section 104 of the Standard Specifications is hereby revised for this project as follows:

Delete subsection 104.02 and replace with the following:

104.02 Alteration of Plans or Character of Work and Variations in Plan Quantities. At any time during progress of the work, the Division may make such alterations in the work within the general scope of the contract, including alterations in quantities, grade or alignment of the road or structure or both, as may be found necessary or desirable. Such alterations shall not invalidate the contract nor release the surety. The Contractor shall accept the work, as altered, the same as if it had been a part of the original contract, except as otherwise provided as follows:

(1) *Changed Project Termini.* Alterations of plans or the nature of the work will not involve or require work beyond the termini of the original project, until a contract modification order has been executed.

(2) *Changed Character of the Work.* If the character of the work or the unit costs thereof are materially changed, a contract modification may be requested by either the Division or the Contractor. Material change of the character of the work to be performed, or the cost thereof as used herein, means altered contract work which differs in kind or nature from that involved or considered in the originally proposed construction and that alters the direct cost of performing that work.

(3) *Changed Physical Condition.* If during the progress of the work subsurface or latent physical conditions at the site differ from those indicated in the contract, or unknown physical conditions at the site differ from those ordinarily encountered and generally recognized as inherent in work of the character provided for in the contract, the Engineer shall be notified before they are disturbed. If the Engineer finds a changed condition, altering the cost for performance of the work, he shall modify the contract accordingly.

Claim made by the Contractor for any loss of anticipated profits, or unrecovered indirect and overhead cost, because of any such alterations, or by reason of any variations between the approximate quantities and the quantities of the work as done, will not be accepted. If the alteration or changed condition is of sufficient magnitude as to require additional time in which to complete the project, such time adjustment will be made in accordance with the provisions of subsection 108.06.

March 10, 1984

REVISION OF SECTION 105
CONFORMITY WITH PLANS AND SPECIFICATIONS

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

Subsection 105.03 shall include the following:

When the aggregate sieve analysis for concrete aggregate deviates from specification requirements and the total P for the item is 3 or greater, the reduction will apply to the contract price multiplied by 0.20 for Items 507, Slope & Ditch Paving, 606, Guardrail, 608, Sidewalks and 609, Curbing.

In subsection 105.03, delete the following items from the Table of Price Reduction Factors:

Compaction, structure backfill
Compaction, base aggregates (Sections 303, 304, 308)
Compaction, earthwork (Section 203)
Compaction, earthwork (Sections 306 and 307)

REVISION OF SECTION 105
CONSTRUCTION STAKES, LINES AND GRADES

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

Delete subsection 105.08 and replace with the following:

105.08 Construction Stakes, Lines and Grades. Construction work shall not be performed until adequate lines and grades have been established by the Division or by the Contractor.

(a) *Contractor Surveying.* When the proposal contains Item 625, Construction Surveying, the Division will provide control points and bench marks as described on the plans and specifications. The Contractor shall furnish and set construction stakes establishing lines and grades in accordance with the provisions of Section 625, Construction Surveying. If the required construction surveying changes, due to modifications in the original scope of work, negotiations for increased or decreased compensation to the Contractor shall be based on the established rate of $100.00 per hour.

(b) *Division Surveying.* When the proposal does not contain Item 625, Construction Surveying, the Engineer will furnish one set of construction stakes and marks establishing lines and grades as described below for proper prosecution of the work.

Roadway staking will include stakes for; fence, centerline, slopes, grades (bluetops), curb and gutter, sidewalk and median barrier. Grade stakes for finished subgrade will not be set until the grade established by the slope stakes is constructed to within 0.3 foot of the finished subgrade elevation.

Minor structures and retaining wall staking will be limited to stakes establishing line and grade by using offset line and grade stakes.

Major structures staking and references will be limited to centerlines (or work lines or control lines) as shown on the plans, appropriate offset lines and grades; and elevations set for footings, piers, pier caps, abutments, bottom of deck grades and finish deck screed grades.

It will be the responsibility of the Contractor to use these references and marks in conjunction with the plans and specifications to transfer and establish any additional control and layout necessary for the proper prosecution of the work in its final location contracted for under these specifications. The Contractor will be responsible for the accuracy of all the control he transfers and establishes. The Contractor shall, when required, provide access on structures to abutments, piers or other locations, and he shall furnish working platforms that meet applicable safety requirements so the Engineer can perform his duties. The Contractor shall be held responsible for the preservation of all stakes and marks, and if any of the construction stakes or marks have been destroyed, disturbed or removed by the Contractor, his subcontractors or suppliers, the cost of replacing them will be charged against him and will be deducted from the payment for the work at the rate of $100.00 per hour.

It is the responsibility of the Contractor to perform all required layout work which shall include, but will not be limited to the following:

(1) Piling locations and cut off elevation.
(2) Steps on piers and abutments.
(3) Bolt locations and patterns.
(4) Construction sign locations.
(5) Guardrail.

The Engineer reserves the right to check all staking and work in place to insure conformance with the plans and specifications. A minimum of two working days will be required as advance notice to the Engineer to provide project control staking.

December 12, 1983

REVISION OF SECTIONS 105 AND 109

LOAD RESTRICTIONS AND WEIGHING MATERIALS

Sections 105 and 109 of the Standard Specifications are hereby revised for this project as follows:

In subsection 105.13, add the following:

Contractor's trucks being weighed by Division personnel will not be given a scale ticket if the load exceeds the legal limit.

Contractors transporting material weighed by certified weighers will not be compensated for any material delivered in vehicles whose gross weight exceeds the legal limit.

In subsection 109.01, delete the tenth paragraph and replace with the following:

The term "ton" will mean the short ton consisting of 2,000 pounds avoirdupois. All materials which are measured or proportioned by weight shall be weighed on accurate scales sealed by the Weights and Measures Section of the Colorado Department of Agriculture as often as the Engineer may deem necessary and at least once each year. Scales shall be furnished by the Contractor or he may elect to utilize commercial scales operated by certified weighers. When the Contractor furnishes the scales at a non-commercial source, they shall be operated by qualified Division personnel at locations designated, and the Contractor shall provide a scale house as shown and described on Page 2 of this special provision for the use of the weigher. The cost of the scales and the scale house will not be paid for separately but shall be included in the contract price for the weighed material.

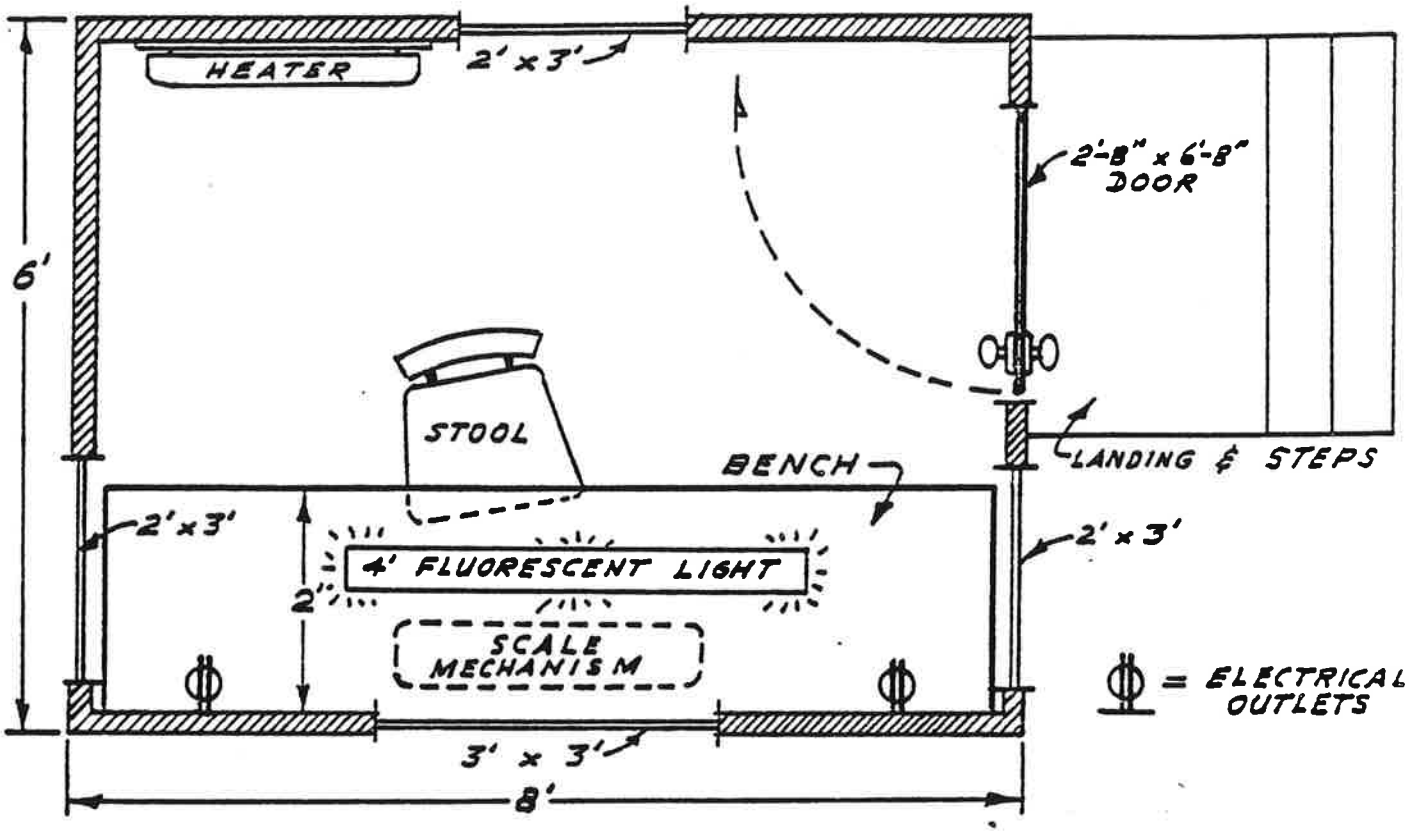
When commercial scales are used, the weighers shall be certified by the Weights and Measures Section of the Colorado Department of Agriculture. A representative of the Division may, at the discretion of the Engineer, be present to witness the weighing and to check and compile the daily record of such scale weights. The operator of each vehicle weighed by a certified weigher shall obtain a weight or load slip from the weigher and deliver said slip to the Engineer at the point of delivery of the material. The cost of the certified weigher and the delivery of the weight or load slip will not be paid for separately but shall be included in the contract price for the weighed material. Unless the certified weigher performs his duties according to the Colorado Department of Agriculture regulations, he will not be allowed to weigh material for state projects.

A commercial scale is defined as one that is available to the general public, either at a commercial source of materials or a public weighing station.

In subsection 109.01, delete the thirteenth paragraph and replace with the following:

Delivery vehicles used to haul material being paid for by weight shall be weighed empty daily and at such times as the Engineer directs.

Each delivery vehicle used to haul such material shall bear a plainly legible identification mark. The Contractor shall furnish to the Engineer, in writing, a list of identification marks, number of axles, and the distance between extreme axles of each delivery vehicle to be used on the project. This information will be furnished prior to time of delivery of the material and at any subsequent time the contractor changes vehicles, combination vehicles, or axle length retionships.



GENERAL NOTES

Scale house shall consist of weather-proof, insulated structure on skids with floor plan and equipment similar to the drawing on this sheet and meeting the following minimum specifications:

OUTSIDE DIMENSIONS: 8' long, 6' wide x 7' high exclusive of skids.
STEPS: One set sturdily built of steel or wood with handrail.
WINDOWS: One 3'-0" x 3'-0" sliding window as shown. Three 2'-0" x 3'-0" sliding windows as shown. All windows capable of opening and locking.
HEATING: Gas furnace, LPG fired, 17,500 BTU, wall mounted as shown.
LIGHTING: One 4' double fluorescent fixture ceiling mounted as shown.
BENCH: Wall mounted bench as shown, 2' wide, 3' high.
DOOR: One, lock equipped, 2'-8" x 6'-8" with clear glass window.
FURNITURE: One cushioned stool with back, adjustable height compatible with bench height.
FIRE EXTINGUISHER: One, non-toxic, dry chemical, UL labeled 6 pound ABC 2A-40BC rating.
ELECTRICAL: 110 volt electrical power shall be provided when the scale house is used during night operations. A circuit breaker box shall be provided in a safe, accessible location.

September 23, 1983

REVISION OF SECTION 108
SUBLETTING OF CONTRACT

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

In subsection 108.01, delete the last sentence of the subsection and add the following paragraphs:

The calculation of the percentage of subcontracted work shall be based on the prime contract unit prices rather than subcontract unit prices. Proportional value for a subcontracted partial contract item shall be verified by the engineer.

For the purpose of calculating the value of subcontracted work, the cost of procuring materials and manufactured products can be included in either the prime contract or subcontract. However, 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.

Subcontracts, or transfer of contract shall not release the contractor of his liability under the contract and bonds.

REVISION OF SECTION 108
TERMINATION OF CONTRACT

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

Delete subsection 108.09 and replace with the following:

108.09 Termination of Contract.

(a) The Division may terminate work under this contract in whole or in part if the Engineer determines such termination is in the Division's best interest. Contract termination will be initiated by the Engineer's written Contract Termination Notice to the Contractor. The notice will specify the extent of the work to be terminated and the effective date.

(b) The Contractor, after receiving the Contract Termination Notice, shall cancel his outstanding commitments for procurement of materials, supplies, equipment and miscellaneous items. In addition, the Contractor shall use reasonable effort to cancel or divert his outstanding subcontract commitments to the extent they relate to any work terminated. With respect to such cancelled commitments the Contractor shall:

(1) Settle all outstanding liabilities and all claims arising out of such cancelled commitments. Such settlements shall be approved by the Engineer and shall be final; and

(2) Assign to the Division all of the rights, title and interest of the Contractor under the terminated orders and subcontracts, as directed by the Engineer. The Division will then have the right to settle or pay any or all claims arising out of the termination of these commitments.

(c) The Contractor shall submit his termination claim to the Engineer within 90 days after the termination notice effective date. During the 90 day period, the Contractor may make a written request for a time extension in preparing his claim. Any time extension must be approved by the Engineer. If the Contractor fails to submit his termination claim within the time allowed, the Engineer may determine the amount due the Contractor by reason of the termination.

(d) Subject to paragraph (c) above, the Contractor and Engineer may agree upon the whole or any part of the amount to be paid to the Contractor because of the termination. The amount may include reasonable cancellation charges incurred by the Contractor. The amount may also include any reasonable loss upon outstanding commitments for subcontracts which the Contractor is unable to cancel, provided the Contractor has made reasonable effort to divert the commitments to his other activities. The amount agreed upon shall be embodied in a Contract Modification Order and the Contractor shall be paid that amount.

(e) Payments claimed and agreed to pursuant to termination shall be based on the contract unit prices. Payment for partially completed lump sum items may be made in the proportion that the partially completed work is to the total lump sum item. Where work performed by the Contractor is of a nature that it is impossible to separate the costs of uncompleted work from completed units, he will be paid the actual cost incurred for the necessary preparatory work and other work accomplished.

(f) The Division may from time to time, under terms and conditions it may prescribe, make partial payments against costs incurred by the Contractor in connection with the contract termination. The total of such payments shall not exceed the amount which, in the Engineer's opinion, the Contractor will be entitled to hereunder.

(g) The Contractor shall transfer title and deliver to the Division, as directed by the Engineer, such items which, if the contract had been completed, would have been furnished to the Division including:

(1) Completed and partially completed work; and

(2) Materials or equipment produced or in process or acquired in connection with the performance of the work terminated by the notice.

Other than the above, any termination inventory resulting from the contract termination may, with written approval of the Engineer, be sold or acquired by the Contractor under the conditions prescribed by and at prices approved by the Engineer. The proceeds of any such disposition shall be applied to reduce any payments to the Contractor under this contract, or shall otherwise be credited to the cost of work covered by this contract, or paid in such other manner as the Engineer may direct. Until final disposition, the Contractor shall protect and preserve all the material related to this contract which is in his possession and in which the Division has or may acquire an interest.

August 2, 1985

REVISION OF SECTION 109
MEASUREMENT AND PAYMENT

Section 109 of the Standard Specifications is hereby revised for this project as follows:

Delete subsection 109.06 and replace with the following:

109.06 Partial Payments. Partial payments will be made once each month as the work progresses, when the Contractor is performing satisfactorily under the contract. Said payments will be based upon progress estimates prepared by the Engiener, of the value of work performed and materials placed in accordance with the contract and the value of the materials on hand in accordance with subsection 109.07. The amount of the progress estimate to be paid to the Contractor will be subject to the following:

(a) *Standard Retainment.* The Division will make a deduction from the progress estimate in the amount considered necessary to protect the interests of the State, pursuant to Section 24-91-103, Colorado Revised Statutes 1973 as amended (CRS). That amount to be retained will be 10% of the value of the completed work, exclusive of mobilization and payments for materials on hand, to a maximum of 5% of the original contract amount. No further retainment will be withheld if the Contractor makes satisfactory progress in the contract work. The amount retained will be in effect until such time as final payment is made, with the following exceptions, each of which requires the Contractor's written request and consent of the Surety:

1. When 97½% of the work has been completed, the Engineer may, at his discretion, reduce the retained amount to twice the value of the remaining work.
2. Upon completion and acceptance of the project, the Engineer may reduce the retainage to 2% of the original contract amount.
3. Further subsequent reductions may be made with the approval of the Chief Engineer.

(b) *Securities in Lieu of Standard Retainment.* When the original contract amount exceeds $80,000 (eighty thousand dollars), the Contractor may withdraw all or any portion of the standard retainment withheld to assure satisfactory performance of the contract, if the Contractor deposits and assigns acceptable securities to the Division, as set forth in Section 24-91-105, CRS and the implementing regulations. Such securities so deposited shall at all times have a market value at least equal in value to the sums so withdrawn. If at any time the Division determines that the market value of the securities has fallen below the sums so withdrawn, it shall give notice thereof to the Contractor, who forthwith shall deposit additional acceptable securities in an amount sufficient to reestablish a total deposit of securities equal in value to the sums so withdrawn. This security substitution shall not apply if a part of the contract price is paid from federal, or other sources, and the federal or other source has requirements which are inconsistent with this subsection.

(c) *Subcontractor and Supplier Claims.* In addition to standard retainment, the Division shall withhold funds for all claims against the Contractor filed by subcontractors and suppliers, pursuant to Section 38-26-107, CRS.

(d) *No Payment.* A partial payment will not be made when the total value of the work done since the last estimate amounts to less than $500.

August 23, 1985

REVISION OF SECTION 109
PAYMENT FOR STOCKPILED MATERIAL

Section 109 of the Standard Specifications is hereby revised for this project as follows:

Delete subsection 109.07 and replace with the following:

109.07 Payment for Material on Hand (Stockpiled Material). Payments may be made to the extent of the delivered cost of materials to be incorporated in the work as evidenced by invoices or cost analyses of material produced on the project subject to the following:

(1) The material conforms to the requirements of the plans and specifications.

(2) The material is stored on the project, on State owned property, or at an acceptable location within the State of Colorado. In the latter case, the Contractor must provide a document signed by the owner and lessee of the property establishing that the Division has a vested interest in, and the right of access to and possession of the material.

(3) The Contractor provides the Engineer with a written cost analysis which confirms that the balance of funds in the corresponding item(s) is sufficient to complete the installation.

(4) The Contractor initially provides the Engineer with a certified invoice followed by proof of payment (paid invoice) for the purchased material within 30 days of the date that said material was included in a partial payment. If proof of payment is not furnished within the 30 day limitation, the value of the stockpiled material will be deducted from the next partial payment.

Payment for stockpiled materials will not relieve the Contractor of responsibility for loss or damage to said material. Payment for living or perishable plant material will not be made under this subsection.

March 10, 1984

REVISION OF SECTION 203
EXCAVATION AND EMBANKMENT MEASUREMENT

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

Subsection 203.17(a), paragraph two shall include the following:

The measured volume of excavation will be reduced by the volume of topsoil removed from the area shown as excavation on the plans.

Subsection 203.17(b) shall include the following:

The measured volume of embankment material will be increased by the volume of topsoil removed from the area below the original ground line and under the embankment, only when the topsoil is designated to be removed within the roadway prism. When the topsoil source is listed as undesignated, embankment will be measured from the original ground line.

REVISION OF SECTIONS 212 AND 213
SEEDING, SODDING AND MULCHING

Sections 212 and 213 of the Standard Specifications and Section 212 of the Supplemental Specifications are hereby revised for this project as follows:

In subsection 212.02(a) delete the first sentence and replace with the following:

(a) Seed. All seed shall be furnished in bags or containers clearly labeled to show the name and address of the supplier, the seed name, the lot number, net weight, origin, the percent of weed seed content, the guaranteed percentage of purity and germination, pounds of pure live seed (PLS) of each seed species and the total pounds of pure live seed in the container.

Subsection 212.04(b) shall include the following:

The Engineer may establish test sections for adjusting the fertilizing equipment to assure conformance with the specified application rate. The Engineer may order equipment readjustment at any time.

Subsection 212.04(c) shall include the following:

The seeding application rate shall be as shown on the plans. The Engineer may establish test sections for adjusting the seeding equipment to assure the specified rate. The Engineer may order equipment readjustment at any time.

In subsection 212.05(c) delete the second sentence and replace with the following:

The rate of application will be as shown on the plans.

Delete subsection 212.06(a).

Delete subsection 212.06(b) and replace with the following:

(b) Fertilizing. Preparatory to seeding, fertilizer shall be applied and tilled into the top four inches of the soil. The fertilizer type and rate of application will be as shown on the plans. The Engineer may establish test sections for adjusting the fertilizing equipment to assure conformance with the specified application rate. The Engineer may order equipment readjustment at any time.

Delete subsection 212.06(c) of the Supplemental Specifications.

In subsection 212.06(c) add a new first paragraph as follows:

(c) Seeding. Seeding shall follow as closely behind the tilling of the fertilizer as necessary, or as directed by the Engineer, to make special seed bed preparation unnecessary. The seeding application rate shall be as shown on the plans. The Engineer may establish test sections for adjusting the seeding equipment to assure the specified rate. The Engineer may order equipment readjustment at any time.

Delete subsection 212.07 and replace with the following:

212.07 The quantities of lawn seeding and native seeding will not be measured but shall be the quantities shown on the plans, completed and accepted; except that measurements will be made for revisions requested by the Engineer, or for discrepancies of plus or minus five percent of the total quantity shown on the plans.

The quantity of lawn seeding shall include soil preparation, fertilizer and seed, completed and accepted.

The quantity of native seeding shall include fertilizer and seed, completed and accepted.

The quantity of sod to be measured will be the actual number of square feet, including soil preparation, fertilizer and sod, completed and accepted.

Continued

REVISION OF SECTIONS 212 AND 213
SEEDING, SODDING AND MULCHING

The Contractor shall furnish the Engineer with seed certifications and analysis, fertilizer analysis, and bag weight tickets prior to placing any seed or fertilizer. Any seed or fertilizer placed by the Contractor without the Engineer's approval will not be paid for.

Measurement for acres will be by slope distances.

In subsection 212.08 delete the first and second paragraphs and replace with the following:

212.08 The accepted quantities of lawn seeding, native seeding and sod will be paid for at the contract unit price for each of the pay items listed below that appear in the bid schedule.

Payment will be made under:

Pay Item	**Pay Unit**
Seeding (Lawn)	Acre
Seeding (Native)	Acre
Sod	Square Foot

Soil preparation, seed and fertilizer will not be paid for separately but shall be included in the work.

Costs for adjusting or readjusting the seeding or fertilizing equipment will not be paid for separately but shall be included in the work.

In subsection 213.02 delete the last paragraph and replace with the following:

The type and application rate of mulch material shall be as shown on the plans.

In subsection 213.03(d), add the following:

The Engineer may order test sections be established for adjusting the mulching equipment to assure conformance with the specified application rate. The Engineer may order equipment readjustment at any time.

Delete 213.04 and replace with the following:

213.04 The quantity of mulching will not be measured but shall be the quantity shown on the plans, completed and accepted; except that measurements will be made for revisions requested by the Engineer, or for discrepancies of plus or minus five percent of the total quantity shown on the plans. Measurement for acres will be by slope distances.

In subsection 213.05 delete the first and second paragraphs and replace with the following:

213.05 The accepted quantities of mulching will be paid for at the contract unit price per acre. Payment will be made under:

Pay Item	**Pay Unit**
Mulching ( )	Acre

Costs for adjusting or readjusting the mulching equipment will not be paid for separately but shall be included in the work.

August 9, 1983

REVISION OF SECTION 214

PLANTING

Section 214 of the Standard Specifications is hereby revised for this project as follows:

In subsection 214.05, first paragraph, delete the second sentence and replace with the following:

> As part of these items, the contract bond required by subsection 103.05 shall guarantee replacement work during the maintenance period.

REVISION OF SECTION 401
PLANT MIX PAVEMENTS-GENERAL

Section 401 of the Standard Specifications is hereby deleted for this project and replaced with the following:

DESCRIPTION

401.01 These specifications include general requirements that are applicable to all bituminous pavements of the plant mix type irrespective of gradation of aggregate, kind and amount of bituminous material, or pavement use. Deviations from these general requirements will be indicated in the specific requirements for each type.

This work shall consist of one or more courses of bituminous mixture constructed on the prepared foundation in accordance with these specifications and the specific requirements of the type under contract, and in reasonably close conformity with the lines, grades, thicknesses, and typical cross sections shown on the plans or established.

MATERIALS

401.02 Composition of Mixtures. The bituminous plant mix shall be composed of a mixture of aggregate, filler or additives if required and approved, bituminous material, and reclaimed material if permitted and used. The several aggregate fractions shall be sized, uniformly graded and combined in such proportions that the resulting mixture meets the grading requirements of the job-mix formula.

The job-mix formula for each mixture shall establish a single percentage of aggregate passing each required sieve size, a single percentage of bituminous material to be added to the aggregate and a single temperature for the mixture at the discharge point of the plant.

After the job-mix formula is established, all mixtures furnished for the project shall conform thereto within the following ranges of tolerances:

Table 401-1

* Passing No. 8 and larger sieves	±	8%
Passing sieves smaller than No. 8 to larger than No. 200	±	6%
Passing No. 200 sieve	±	3%
Bitumen content	±	0.5%
Asphalt recycling agent	±	0.2%
Temperature of mixture when discharged from mixer	±	20°F

* When 100% passing is designated, there shall be no tolerance.

The job-mix formula for each mixture shall be in effect unless modified in writing on DOH Form 43. Requests made in writing by the Contractor for changes in the job-mix formula will be considered. The job-mix formula may be changed by the Engineer if the change will produce a mixture of equal or better quality and will:

(1) Permit better utilization of available material or,

(2) Result in a saving in cost to the Division through an adjustment in unit price.

Tests for cleanliness, abrasion loss and percent of fractured faces will be made on representative samples of aggregate taken during production or from the stockpiles.

The Contractor's proposed job-mix formula for each hot bituminous pavement grading will be tested by the Division. It shall be based on materials actually produced and stockpiled for use on the project. When Laboratory tests indicate that a proposed job-mix formula meets Table 403-1, as revised for the project, a DOH Form 43 shall be executed between the Engineer and the Contractor to establish the job-mix formula.

The Division will process a maximum of three asphalt design mixes at no charge to the Contractor. A charge will be made for the testing and evaluating of each additional design mix submitted by the Contractor.

At the discretion of the Engineer, the job-produced hot bituminous plant mix may be tested for conformance to the criteria shown in Table 403-1 as revised for the project. Failure to meet any of the criteria shall be grounds to require the Contractor, at his expense, to take corrective action before

(continued)

being permitted to continue production. If proper corrective measures cannot be readily determined, the Engineer will suspend the use of such material until Laboratory tests indicate that the corrective measures taken by the Contractor yield material that is in compliance with Table 403-1. Corrective measures shall be documented on DOH Form 43.

Reclaimed material will be accepted in bituminous plant mix provided that all the requirements for hot bituminous pavement are met. When more than 40% reclaimed material is used in the mix, an asphalt recycling agent or softer grade of asphalt may be required to soften the asphalt cement of the reclaimed material to the consistency of the new asphalt cement specified for the project. The reclaimed material shall meet the requirements of subsection 703.04. Asphalt recycling agent shall meet the requirements of subsection 702.06.

The Contractor shall submit the following to the Engineer:

(1) A proposed job-mix gradation which shall be wholly within the Master Range Table, Table 703-1, when the tolerances shown in Table 401-1 are applied.
(2) Source, approximate gradation, and percentage of each element used in producing the final mix.
(3) The name of the refinery which will supply the asphalt cement.
(4) A quantity of each aggregate, mineral filler, reclaimed material, and/or additive proposed for use which is sufficient for the required Laboratory tests.

401.03 Aggregates. Aggregates shall meet the applicable requirements of Section 703-Aggregates.

401.04 Mineral Filler. Mineral filler shall meet the requirements of subsection 703.06.

401.05 Hydrated Lime. Hydrated lime shall meet the requirements of subsection 712.03.

401.06 Bituminous Materials. The type and grade of bituminous material will be specified in the contract.

The bituminous material shall meet the applicable requirements of Section 702-Bituminous Materials.

Anti-stripping additives shall meet the requirements of subsection 712.10.

CONSTRUCTION REQUIREMENTS

401.07 Weather Limitations. Bituminous plant mix shall be placed only on properly constructed and accepted layers that are free from water, snow, or ice. The bituminous mixtures shall be placed in accordance with the temperature limitations of the following table and only when weather conditions otherwise permit the pavement to be properly placed and finished as determined by the Engineer.

PLACEMENT TEMPERATURE LIMITATIONS

Compacted Layer Thickness (inches)	AIR AND SURFACE TEMPERATURE MINIMUM (degrees F)	
	Top Layer of Completed Pavement	Layers Below Top Layer
1 or less	70	50
>1 to 3	50	40
>3	doesn't apply	30

Notes: Air temperature is taken in the shade. Surface is defined as the existing base on which the new pavement is to be placed. The 70° requirement for one inch or less layer thickness is reduced to 60° above 7500 foot elevation.

When it is in the public interest, the Engineer may waive minimum temperature requirements for placing prime coats and layers of bituminous mixtures below the top layer of the completed pavement.

(continued)

REVISION OF SECTION 401
PLANT MIX PAVEMENTS-GENERAL

401.08 Bituminous Mixing Plant. The bituminous mixing plant shall be capable of producing a uniform material and shall have adequate capacity.

The plant shall be maintained in good mechanical condition. Any defective parts shall be replaced or repaired immediately if they adversely affect the proper functioning of the plant or plant units, or adversely affect the quality of the hot bituminous plant mix in any manner.

Dust, smoke or other contaminants shall be controlled by means of appropriate devices at the plant site to meet all air pollution requirements in accordance with subsections 107.01 and 107.24.

Acceptable safety equipment shall be provided by the Contractor to accommodate sampling and testing and shall be subject to approval.

Hot bituminous plant mix shall not be stored longer than nine hours, unless additional protective measures are used and approved.

401.09 Hauling Equipment. Trucks used for hauling bituminous mixtures shall have tight, clean, smooth metal beds which have been thinly coated with a minimum amount of paraffin oil, lime solution or other approved release agent. Petroleum distillates such as kerosene or fuel oil will not be permitted. Except as otherwise permitted, each truck shall have a cover of canvas or other suitable material of such size as to protect the mixture from the weather.

401.10 Bituminous Pavers. Bituminous pavers shall be self-contained, power-propelled units, provided with an activated screed or strike-off assembly, heated if necessary, and capable of spreading and finishing courses of bituminous plant mix material in widths applicable to the specified typical section and thicknesses shown on the plans. The paving machine shall be equipped with an automatic control system which will control the elevation of the screed and which is automatically actuated by a system of sensor-operated devices which sense and follow reference lines or surfaces on one or both sides of the machine as required. The screed shall be maintained at the proper elevation at each end by controlling the elevation of one end and automatically controlling the transverse slope by controlling the elevation of each end independently, as directed. The automatic control system shall be capable of working with the following devices:

(1) Ski-type device at least 30 feet in length.
(2) Short ski or short shoe.
(3) At least 5,000 feet of control line and stakes.

The type or types of devices to be furnished shall be as called for on the plans.

When the control line is to be used, it shall be installed by the Contractor and shall be maintained taut and to the grade and alignment established.

The screed or strike-off assembly shall effectively produce a finished surface of the required evenness and texture without tearing, shoving or gouging the mixture.

When laying mixtures, the paver shall be capable of being operated at forward speeds consistent with satisfactory laying of the mixture.

Placement of hot bituminous pavement on a waterproofed bridge deck shall be accomplished with equipment that will not damage the membrane or protective covering.

401.11 (Unused).

401.12 Conditioning of Existing Surface. When the surface of the existing pavement or old base is irregular, it shall be brought to uniform grade and cross section as directed.

Contact surfaces of curbing, gutters, manholes, and other structures shall be painted with a thin, uniform coating of bituminous material prior to the bituminous mixture being placed against them.

401.13 Preparation of Bituminous Material. The bituminous material shall be heated to the specified temperature in a manner that will avoid local overheating and provide a continuous supply of the bituminous material to the mixer at a uniform temperature.

(continued)

REVISION OF SECTION 401
PLANT MIX PAVEMENTS-GENERAL

401.14 Preparation of Aggregates. Heating and drying of the aggregates shall be accomplished in a manner that does not damage the aggregate.

When hydrated lime is required, it shall be added to the aggregate and stockpiled to undergo an aging process in accordance with the following:

(a) *Dry Hydrated Lime Added to Wet Aggregates.* A minimum of one percent hydrated lime (by dry weight of total aggregate) shall be added to the aggregate. Hydrated lime, water and aggregate shall be thoroughly mixed in an approved mechanical mixer and shall then be stockpiled in one or more stockpiles. The mixture shall contain between 5 percent and 8 percent moisture at the time it is stockpiled. If the aggregate contains excess moisture, the excess shall be removed before adding hydrated lime. The mixed material shall remain in the stockpile(s) for a minimum of 5 days unless otherwise approved.

(b) *Lime Slurry Added to Aggregate.* A minimum of one percent hydrated lime (by dry weight of total aggregate) shall be added to the aggregate. The lime shall be added to the aggregate in the form of a slurry. The lime slurry shall contain a minimum of 70 percent water by weight. The slurry and aggregate shall be thoroughly mixed in an approved mechanical mixer and shall then be stockpiled in one or more stockpiles. The mixed material shall remain in the stockpile(s) for a minimum of one day before being processed to produce hot bituminous plant mix unless otherwise approved.

401.15 Mixing. The aggregates shall be combined in the mixer in the amount of each fraction of aggregates required to meet the job-mix formula. The bituminous material shall be measured or gauged and introduced into the mixer in the amount specified by the job-mix formula.

After the required amounts of aggregate and bituminous material have been introduced into the mixer, the materials shall be mixed until a complete and uniform coating of the particles is secured.

The temperature of the mixture when discharged from the mixer shall be as shown in the following table:

Asphalt Grade	Job-mix Temperature (degrees F)
AC 20 (Rubberized)	300
AC-20	290
AC-10	280
AC-5	275

Regardless of the job-mix temperature, the mixture shall not be delivered for use on the roadway at a temperature lower than 235°F.

When placing hot bituminous pavement over bridge decks covered by waterproofing membrane, the minimum temperature of hot bituminous pavement at the time rolling operations begin shall be 250°F. To assure this temperature, the job-mix formula temperature may be increased up to 30°F.

401.16 Spreading and Finishing. The mixture shall be laid upon an approved surface, spread and struck off to the grade and elevation established. Bituminous pavers shall be used to distribute the mixture either over the entire width or over such partial width as may be practicable. The longitudinal joint in one layer shall offset that in the layer immediately below by approximately six inches. The joints in any pavement layer shall not fall in a wheel track. The joints in the top layer shall be located as follows:

(1) For two-lane roadways, at the centerline of the pavement and at the outside edge of the travel lanes.

(2) For roadways of more than two lanes, at the lane lines and at the outside edge of the travel lanes.

Where paving operations are on the present traveled roadway, the Contractor shall arrange his paving operations so that there will be no exposed longitudinal joints between adjacent travel lanes at the end of a day's run. In lieu of this requirement, with the approval of the Engineer, the Contractor may be permitted:

(1) A vertical or tapered exposed longitudinal joint when the thickness of pavement course being placed is one inch or less.

(continued)

(2) A tapered exposed longitudinal joint when the thickness of pavement course being placed is greater than one inch. Minimum width of taper shall be three times the thickness of the pavement course.

On areas where irregularities or unavoidable obstacles make the use of mechanical spreading and finishing equipment impracticable, the mixture shall be spread, raked and luted by hand tools. For such areas, the mixture shall be dumped, spread and screeded to give the required compacted thickness.

When production of the mixture can be maintained and when practical, pavers shall be used in echelon to place the wearing course in adjacent lanes.

The bituminous mixture shall be transported and placed on the roadway in such manner as to minimize segregation. All segregated areas behind the paver shall be removed immediately at the time of discovery. The segregated material shall be replaced with specification material before the initial rolling has taken place. If more than 50 square feet of segregated pavement is ordered removed and replaced in any continuous 500 linear feet of paver width laydown, paving operations with the paving machine involved shall be discontinued until the source of the segregation has been found and corrected.

The Engineer will determine by judgment the extent of segregated areas. It is not intended that each segregated area be sampled and tested; however, segregation is defined as follows: Representative samples of allegedly segregated areas will be tested in accordance with Colorado Procedures 42 and 31. The mixture will be designated as segregated when the percent passing the No. 4 sieve varies from the average of the previous five acceptance tests by more than nine percentage points. Where less than five acceptance tests are available for the average, all acceptance tests prior to that time will be averaged for comparison to the sampling being checked for segregation. The Contractor will not be allowed additional compensation for correction of segregated areas.

401.17 Compaction. The plant mix bituminous pavement shall be compacted by rolling. Both steel wheel and pneumatic tire rollers will be required, unless otherwise approved. 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 as soon as possible after the mixture is placed and be continuous until the required density is obtained. When the mixture surface temperature falls below 185°F, no further compaction effort will be permitted unless approved.

All roller marks shall be removed with the finish rolling. Use of vibratory rollers with the vibrator on will not be permitted during surface course final rolling and will not be permitted on any rolling on bridge decks covered with waterproofing membrane. A minimum density of 95% of the laboratory specimen will be required for all hot plant mix bituminous pavement gradings, except that 93% will be reguired for Grading F with more than 65% of the aggregate passing the No. 8 sieve. Field density determinations will be made in accordance with Colorado Procedure 44 or 81. Along forms, curbs, headers, walls and all other places not accessible to the rollers, the mixture shall be thoroughly compacted with mechanical tampers. Any mixture that becomes loose and broken, mixed with dirt, or is in any way defective, shall be immediately removed and replaced with fresh hot mixture and shall be compacted to conform with the surrounding area.

401.18 Joints. Placing of the bituminous paving shall be as continuous as possible. Rollers shall not pass over the unprotected end of a freshly laid mixture unless authorized. Transverse joints shall be formed by cutting back on the previous run to expose the full depth of the course. When directed by the Engineer, a coat of bituminous material shall be used on contact surfaces of all joints just before additional mixture is placed against the previously rolled material. Location and configuration of joints shall be in accordance with subsection 401.16.

401.19 Pavement Samples. The Engineer may take samples of the compacted pavement at random locations on the project for testing. Where samples have been taken, new material shall be placed and compacted by the Contractor to conform with the surrounding area.

(continued)

REVISION OF SECTION 401
PLANT MIX PAVEMENTS-GENERAL

401.20 Surface Tolerances. The variation between any two contacts with the surface shall not exceed 3/16 inch in 10 feet. All humps or depressions exceeding the specified tolerance shall be corrected by removing defective work and replacing it with new material as directed.

METHOD OF MEASUREMENT

401.21 Plant mix bituminous pavement and bituminous material will be measured by the ton. Batch weights will not be permitted as a method of measurement. The tonnage shall be the weight used in the accepted pavement. Deduction will not be made for the weight of bituminous material in the mixture.

BASIS OF PAYMENT

401.22 All work performed and measured as prescribed above will be paid for as provided in the respective sections for each type specified.

Work prescribed in subsection 401.12 will be paid for at the contract unit prices for the material used.

If there is no pay item for bituminous material of the type specified it will not be measured and paid for separately but shall be included in the work.

Water used in the mixing plant, in accordance with subsection 401.14, to bring the lime-aggregate mixture to approved moisture content will not be measured and paid for separately but shall be included in the work.

February 7, 1986

REVISION OF SECTIONS 412 AND 601
CONCRETE (BATCHING)

Sections 412 and 601 of the Standard Specifications are hereby revised for this project as follows:

Subsections 412.08 and 601.06 shall include the following:

The Contractor shall furnish a one sheet load slip containing the information required by AASHTO M 157, section 13, subsections 13.1 and 13.2 with each batch of concrete, except for bridge deck concrete. In addition the Division's design number shall be shown on each load slip. Concrete delivered without a load slip containing complete information as specified will be reason for rejection.

The DOH Form 281 is available upon request.

The drum on each mixer shall be reversed prior to charging to preclude any wash water remaining in the mixer.

Division personnel on the project will sample and test the concrete at the work site as required by published Division Specifications and Materials Manual.

December 21, 1982

REVISION OF SECTION 502
PILING

Section 502 of the Standard Specifications is hereby revised for this project as follows:

In subsection 502.06, delete the sixth paragraph and replace with the following:

The diameter of the drilled holes and/or the material used to fill oversize holes shall be as stipulated herein unless otherwise designated on the plans.

The minimum diameter of the drilled holes shall be 1 inch larger than the average between the tip and butt diameters of timber piles or 1 inch larger than the outside diameter of steel pipe piles. The minimum diameter of the drilled holes shall be 2 inches larger than the web depth for "H" piles.

The maximum diameter of the drilled holes shall be 2 inches larger than the minimum diameter specified above. If the maximum diameter of the drilled hole is exceeded due to sluffing, drifting, over-drilling, or other causes, the void area between the driven pile and the edge of the hole shall be filled with sand or pea gravel.

July 1, 1983

REVISION OF SECTION 509
STEEL STRUCTURES

Section 509 of the Standard Specifications is hereby revised for this project as follows:

In subsection 509.02, delete the last sentence and replace with the following:

When AWS D1.1 is cited in this Section, the reference shall be to the latest edition of the American Welding Society Structural Welding Code-Steel, AWS D1.1, as amended by the latest edition of the AASHTO Standard Specifications for Welding of Structural Steel Highway Bridges.

Delete subsection 509.20 and replace with the following:

509.20 Mill and Shop Inspection.

(a) Notice of Placing of Shop Order. Shop work shall not be started until the Contractor notifies the Engineer in writing where the shop orders were placed.

(b) Notice of Beginning of Work. The Contractor shall give ample written notice to the Materials Laboratory Inspection Unit, prior to beginning of shop work, so that inspection may be provided.

(c) Mill-test Reports. The Contractor shall furnish the Materials Laboratory Inspection Unit with copies of reports of manufacturer's mill-tests on all material that will be used. Mill-test reports shall be furnished prior to cutting of the steel or any other fabrication. The Contractor may furnish material from stock, provided it can be identified by heat number, mill-test report, and color code.

In subsection 509.21(h)2, Figure 509-A, delete footnote (7) and replace with the following:

Type Y discontinuities shall be removed by machining or grinding if the actual net cross sectional area which would remain after removal of the discontinuity is 98% or greater of the area of the plate based on nominal dimensions. Such removal shall be faired to the plate edge with a slope not exceeding 1 in 10, and with machining or grinding marks parallel to the plate surfaces.

In subsection 509.22(j)4, revise the size of the offset from 1/8 inch to 1/16 inch.

Delete subsection 509.23(a) and replace with the following:

(a) General. Welding of steel structures shall conform to AWS D1.1.

Delete subsection 509.24 and replace with the following:

509.24 Inspection of Welds.

(a) Welds shall be inspected in accordance with the requirements of AWS D1.1 as modified herein. In accordance with the AASHTO Specifications mentioned in subsection 509.02, Quality Control inspection and testing and Quality Assurance inspection and testing are separate functions.

1. Quality Control (QC) is the responsibility of the Contractor. He shall perform inspection and testing at least to the extent specified and additionally as he determines necessary.

2. Quality Assurance (QA) is the prerogative of the Division. Inspection and testing will be performed as necessary to assure an acceptable product in accordance with the contract documents.

(b) Dye Penetrant Testing is allowable in addition to or in lieu of Magnetic Particle Testing as required in the section on Non-destructive Testing in the AASHTO Standard Specifications referred to in subsection 509.02.

(c) The requirements for fillet weld testing shall apply equally to shop and field welds.

REVISION OF SECTION 509
STEEL STRUCTURES

(d) Quality of Welds.

1. Appendix I - Terms and Definitions (AWS D1.1). The present definition of fusion-type defect shall be deleted and replaced with the following new definition.

   Fusion-type defect: Signifies slag inclusions and similar elongated defects. Sharp, crack-like defects, such as may be encountered in incomplete fusion and inadequate penetration, shall be considered as fusion-type defects.

2. Welds shall not have cracks nor incomplete fusion, shall not have less than the specified penetration, and shall not have other discontinuities exceeding the limits in size or frequency of occurrence as specified in Sections 8, 9, & 10 of AWS D1.1. Appendix F of AWS D1.1 illustrates the application of these requirements.

(e) The inspector will make certain that each welding procedure which is proposed for use on this work is covered by a written welding procedure specification and that such specifications are available to the welders for reference.

In subsection 509.35, delete the last paragraph and replace with the following:

The Division will pay the cost of all Quality Assurance inspection and testing. The cost to the Contractor for all Quality Control inspection and testing will not be paid for separately, but shall be included in the work.

January 6, 1984

REVISION OF SECTION 509
STEEL STRUCTURE CONNECTIONS

Section 509 of the Standard Specifications is hereby revised for this project as follows:
Delete subsection 509.28 and replace with the following:

509.28 Connections Using High-Strength Fasteners.

(a) **Field Connections.** Unless otherwise specified, all field connections shall be made with fasteners consisting of high-strength bolts or lock-pin and collar.

(b) **Bolted parts.** Bolted parts shall fit solidly together when assembled and shall not be separated by gaskets or any other interposed compressible material. All joint surfaces, when assembled, shall be free of scale, except tight mill scale, and shall be free of dirt, burrs, other foreign material and other defects that may prevent solid seating of the parts. Contact surfaces within friction-type joints shall be free of oil, paint, lacquer, or rust inhibiter. Contact surfaces may be galvanized when specified on the plans.

(c) **Installation.** Each fastener shall be tightened to provide, when all fasteners in the joint are tight, no less than the minimum bolt tension shown in Table 509-7 for the size of fastener used. All tightening shall be done by methods and procedures as approved.
A minimum of 10 percent of the bolts (must be at least six bolts) in each splice shall be tightened sufficiently to assure all plates are in firm contact before final tensioning is started.

1. Threaded bolts shall be tightened by a method which includes the use of load indicator fasteners.
2. Fastening by use of lock-pin and collar fasteners is permitted. The Contractor must demonstrate by an accurate direct measurement device that the pin has been tightened in accordance with Table 509-7.
3. Impact wrenches, if used, shall be of adequate capacity to perform the required tightening of each bolt in approximately 10 seconds.
4. All fasteners shall have a hardened washer under the element (nut or bolt head) turned in tightening.
5. Where the outer face of the bolted parts has a slope of more than 1:20 with respect to a plane normal to the bolt axis, a smooth beveled washer shall be used to compensate for lack of parallelism.
6. Bolts may be reused once, if approved. Load indicator washers shall be tensioned only once and shall not be reused. Retightening previously tightened bolts shall not be considered as reuse.

TABLE 509-7

Bolt Size (in.)	Required Minimum Bolt Tension (lb.*)
½	12,050
⅝	19,200
¾	28,400
⅞	39,250
1	51,500
1 ⅛	56,450
1 ¼	71,700
1 ⅜	85,450
1 ½	104,000

*Equal to 70% of specified minimum tensile strength of bolts.

(d) **Inspection.** The Contractor shall provide means of support satisfactory to the Division from which Division personnel can inspect bolt tension and determine whether the work meets specification requirements.

The following inspection procedure shall be used unless a more extensive or different inspection is specified.

1. The Engineer will inspect a sufficient number of fasteners to assure compliance with Table 509-7. He will use a method commensurate with the type of fastener used. All loose fasteners must be brought into compliance.
2. The Contractor shall demonstrate that his bolt tightening method is providing tension in accordance with Table 509-7. The demonstration shall be done daily on a minimum of three fasteners using an accurate direct-tension measuring device. There shall be a hardened

washer under the part (nut or bolt head) turned in tightening each bolt. The direct tension measurement device shall be furnished by the Contractor, and must be certified by a testing laboratory at least once a year.

December 27, 1984

REVISION OF SECTION 512
BEARING DEVICE

Section 512 of the Standard Specifications is hereby revised for this project as follows:

In subsection 512.03 delete the second paragraph and replace with the following:

Pads ¾ inch or less in thickness may be either laminated or plain. Pads over ¾ inch in thickness shall be laminated.

In subsection 512.04 delete the first and second paragraphs and replace with the following:

512.04 Type II Bearing Device. The upper sliding element shall consist of a stainless steel sheet attached to a sole plate. The stainless steel sheet shall be epoxy bonded, mechanically fastened or tack welded to the sole plate. The operating coefficient of static friction between the stainless steel and the TFE sheet, when loaded to 800 psi, shall not exceed 0.06 at installation.

The lower sliding element shall consist of a filled or unfilled TFE sheet with a minimum thickness of 3/32 inch bonded or mechanically connected, by an accepted method, to a rigid substrate material. The substrate material shall be capable of resisting bending stresses to which the sliding surface may be subjected. The other side of the substrate material shall be bonded to an elastomeric pad (Type I Bearing Device) as shown on the plans. The substrate material shall have sufficient tensile strength to restrain the elastomeric pad.

REVISION OF SECTION 515
WATERPROOFING MEMBRANE

Section 515 of the Standard Specifications is hereby deleted for this project and replaced with the following:

DESCRIPTION

515.01 This work shall consist of furnishing and placing a CDOH approved waterproofing membrane and protective covering over a prepared concrete bridge deck surface. The waterproofing membrane shall consist of one of the following:

(1) A prefabricated reinforced membrane and primer or,
(2) A single component, hot applied, elastomeric membrane and primer if required.

MATERIALS

515.02 Materials shall meet the requirements specified in the following subsections of Section 700-Materials:

Protective Covering	705.07
Prefabricated, Reinforced Membrane and Primer	705.08
Single Component, Hot Applied, Elastomeric Membrane	705.09

CONSTRUCTION REQUIREMENTS

515.03 Condition of Concrete Deck. The entire deck and the sides of the curbs for a height of two inches above the plan thickness of the hot bituminous pavement shall be free of all foreign material such as dirt, grease, old pavement and primer. Sand blasting will be required on all decks. Immediately prior to the application of primer or any type of membrane, all dust and loose material shall be removed. Approval of the deck condition before application of membrane will be required in writing from the Engineer.

515.04 Weather and Moisture Limitations. Application of primer or membrane shall not be done during inclement weather conditions, or when deck and ambient air temperatures are below 50°F. The deck surface shall be dry at the time of application of primer and membrane.

515.05 Application, Prefabricated, Reinforced Membrane. Primer shall be applied to the prepared concrete surface at the rate and according to the procedure recommended by the membrane manufacturer. Placement of the membrane shall not begin until essentially all volatile material in the primer has dissipated. The membrane shall be placed in such a manner that a shingling effect will be achieved and any accumulation of water will be directed toward curbs and drains. Primer and membrane shall be placed on the curb faces for a height of two inches above the plan thickness of the hot bituminous pavement. The entire membrane shall be essentially free of wrinkles, air bubbles and other placement defects. Blisters or bubbles larger than two inches in diameter, which develop after placement of the membrane and before placement of protective covering, shall be punctured, the air expelled and patched in a manner satisfactory to the Engineer. At all expansion joints, and other joints, membrane shall be flashed up to the top of the joint and secured with primer. At drain pipes, membrane shall be placed in such a manner that it extends down inside the drain and is secured with primer.

515.06 Application, Single Component, Hot Applied, Elastomeric Membrane. Hot applied membrane shall be applied to the prepared deck surface at a uniform rate of 90±20 mils. (1 mil.=.001 inch). During application the thickness will be measured by the Engineer. Lack of reasonably uniform application shall be cause for termination of the work until remedial measures are taken. Primer, if required, and membrane shall be placed up the curb faces for a height of two inches above the plan thickness of hot bituminous pavement.

515.07 Application of Protective Covering. As soon as practical, but in all cases the same day as membrane application, protective covering shall be placed from gutter line to gutter line. Protective covering shall be laid parallel to the centerline of the bridge. The protective covering shall be butted together at longitudinal and transverse joints. Overlapping will not be permitted. The maximum

(continued)

allowable space between adjoining sections of protective covering shall be three-eights inch. Following placement of protective covering, a bead of compatible mastic or hot applied membrane shall be applied where the protective covering contacts the curbs. The bead shall fill the void preventing water from entering at this point.

Upon completion of the membrane and protective covering the Engineer will inspect the membrane system.

Approval in writing from the Engineer shall be obtained before application of hot bituminous pavement. The Contractor shall be responsible for maintaining the condition of the membrane system on the bridge deck until covered with hot bituminous pavement to the thickness required by the plans and specifications.

Hot bituminous pavement shall be placed, spread and compacted, in accordance with the specifications or as approved.

515.08 Measuring Waterproofing Effectiveness. Measurement of waterproofing membrane effectiveness shall be done at a time when the membrane pavement system is free of moisture from precipitation or moisture induced by rolling operations. Measurement shall be in accordance with Colorado Procedure 62. When tests conducted under the above conditions have electrical resistance readings lower than 200,000 ohms, the Contractor may be required to remove and replace, or repair, the hot bituminous pavement and membrane, at his expense.

If the presence of moisture in the membrane system prevents testing of waterproofing effectiveness by Colorado Procedure 62 within a reasonable time after placement, acceptance of the system may be made by inspection and documented in writing by the Engineer.

METHOD OF MEASUREMENT

515.09 Waterproofing membrane including protective covering, complete in place, will be measured by the number of square yards of bridge deck covered. Material placed on curb faces will not be measured.

BASIS OF PAYMENT

515.10 The accepted quantities of waterproofing membrane including protective covering will be paid for at the contract unit price per square yard.

Payment will be made under:

Pay Item	Pay Unit
Waterproofing (Membrane)	Square Yard

Hot Bituminous Pavement will be measured and paid for in accordance with Section 403.

REVISION OF SECTION 601
STRUCTURAL CONCRETE

Section 601 of the Standard Specifications is hereby revised for this project as follows:

Subsection 601.02 is deleted, including the table "CONCRETE TABLE" and footnotes, and replaced with Table 601-1 and the following:

601.02 Classification. The classes of concrete shown in Table 601-1 shall be used where required by the plans. However, the classes listed below may be used in lieu of the class specified on the plans.

If this class is specified.	These classes can be used instead.
A	AX, B, D
AZ	AX, BZ
B	AX, D
P	AX,*(A,B)

*See subsection 412.03

Classes "D", "DT" and "DX" concrete require an approved water reducing admixture. Where Class "D" or "DX" concrete is specified for areas other than bridge decks or pavement slabs, the slump (consistency) may be increased to four inches maximum.

Class "S" prestressed concrete when used in a structure deck shall have an air content of five to eight percent and a maximum water/cement ratio of 0.44.

TABLE 601-1

CONCRETE CLASSES with 28 day Field Compressive Strength and Brief Description	CONCRETE SPECIFICATIONS					
	Cement (Lbs./cu. yd.)	Maximum Water/Cement Ratio (lbs. H^2O/lb of Cement)	Air Content % Range (Total)	Maximum Slump (inches)	Coarse Aggregate Section 703, Table 703-(Size No.)	Fine Aggregate (Maximum % of Total Aggregate)
A 3000 Psi 1½" Aggregate	565	0.50	4-8	4	467 or 57	45%
AX 4000 Psi Local Aggregate	610	0.45	5-8	3	See Gradation in subsection 601.03	
AZ 4000 Psi 1½" Aggregate	610	0.45	5-8	4	467 or 57	45%
B 3000 Psi ¾" Aggregate	565	0.53	5-8	4	67	50%
BZ 4000 Psi ¾" Aggregate	610	0.48	5-8	4	67	50%
D 4500 Psi Deck	660	0.44	5-8	2.5 (Design) 3.25 (Field)	67	50%
DT 4500 Psi Deck Topping	700	0.44	5-9	2.5	7	50%
DX 4500 Psi Local Aggregate Deck	660	0.44	5-8	2.5 (Design) 3.25 (Field)	See Gradation in subsection 601.03	
EA 3000 Psi Exposed Aggregate	565	0.53	5-8	4	6 or 67	40%
P 3000 Psi Pavement	565	0.50	4-8	3	467 or 357	45%
S specified on plans Prestressed	660	See subsection 601.02 for deck requirements		--	--	--

REVISION OF SECTION 601
STRUCTURAL CONCRETE

In subsection 601.03 delete the second paragraph.

Subsection 601.05(a) is deleted and replaced with the following:

(a) Design. All concrete placed on the project shall be based on the design mix. The Contractor shall be responsible for the mix proportions and all subsequent adjustments necessary to produce the specified concrete. The Field Compressive Strength for each class of concrete, except Class "S", in Table 601-1 is not a specification requirement. The compressive strength of the Laboratory trial mix shall be at least 25% greater than the desired 28 day Field Compressive Strength.

Cement content greater than that specified in Table 601-1 is permissable.

For new sources, the proposed mix proportions and sufficient materials to be tested shall be submitted to a CDOH Laboratory for a trial mix a minimum of 40 days before production is scheduled to begin.

For previously used or currently used mix designs, the Engineer may approve the mix proportions without a trial mix.

A change of the source of cement, fly ash or aggregate will be subject to prior approval by the Engineer.

The Contractor may request approval of design mixes that utilize combinations of approved materials from different sources. When an approved mix design exists for any combination of approved cement and aggregates, the Engineer may grant approval for changing from one approved mix design to any other during the progress of construction. In an emergency situation, in order to maintain the work schedule, the Contractor may request an emergency design mix using combinations of approved materials for which an approved design mix does not exist. The Engineer may permit such action provided the latest approved design mix proportions in use are used for the new combination of ingredients, except that an additional 25 lbs. of cement per cubic yard of concrete shall be added to the emergency design mix. There will be no change in the Contract unit price for the product due to the Contractor's variations in the design mix, as permitted within the limits of this paragraph.

Upon approval based on a satisfactory trial mix, the Contractor shall have the option of substituting approved fly ash for portland cement, up to a maximum of 20% by weight, in any class concrete shown in Table 601-1. The total weight of cement plus fly ash shall not be less than the weight for cement content as shown in Table 601-1 for any given class. Where the voluntary use of fly ash by the Contractor results in delays, necessary changes in admixture quantities or admixture source, or unsatisfactory work, the costs of such delays, changes or corrective actions shall be borne by the Contractor.

In subsection 601.07(d) add the following as a new paragraph:

The Contractor shall perform calibration tests according to the equipment manufacturer's recommendations at the beginning of each project, and when there is a change in the mix design proportions or source of materials. The Engineer may require a calibration test or yield check whenever a change in the characteristics of the mixture is observed. The tolerances in proportioning the various ingredients shall be according to subsection 6.8 of AASHTO M-241.

In subsection 601.12(n) delete the second sentence and replace with the following:

The structure may be opened to traffic earlier if the concrete deck and all other concrete has attained the Field Compressive Strength given in Table 601-1.

REVISION OF SECTION 601
STRUCTURAL CONCRETE

In subsection 601.15(b) second paragraph, delete the first sentence and replace with the following:

The Contractor shall provide suitable mechanical vibrators to melt down the batch at the point of discharge and to densify the concrete within the forms.

In subsection 601.15(d) first paragraph, delete the first sentence and replace with the following:

After the floating has been completed but while the concrete is still plastic, the Engineer may determine that the surface of the concrete should be tested for trueness.

Subsection 601.161 is added following subsection 601.16 as follows:

601.161 Acceptance Sampling and Testing for Structural Concrete.

(a) Sampling and Testing. Every batch shall be sampled and tested (100% sampling and testing) for air content and slump at the start of a concrete production. A batch shall consist of one mixer truck load, or each 10 cubic yards when a mobile mixer is used.

Random sampling and testing for air content or slump or both at the rate of one for every five successive batches, may be substituted for 100 percent sampling and testing if the test results for three successive batches are within the specification limitations for air content and slump. However, 100 percent sampling and testing will be reinstated for that particular property if a test result for any random sample is outside the specification limitations.

(b) Air Content. Air content will be determined by AASHTO T 152. AASHTO T 199 may be used for acceptance but not rejection by the Engineer. At any time during the placement of the concrete, when a batch deviates from the minimum or maximum percent of total air content specified, the following procedure will be used to analyze the acceptability of the concrete.

1. A batch that deviates from the specified air content by more than one percent will be rejected. Portions of loads incorporated into structures prior to determining test results which indicate rejection as the correct course of action shall be subject to acceptance at reduced price, no payment, or removal as determined by the Engineer.

2. A batch that deviates from the specified air content by one percent or less, may be incorporated into the project at a reduced price, calculated as follows: The first batch that deviates from the specified air content by one-half percent or less, may be accepted at full price. If the batch deviates from the specified air content by more than one-half percent and up to one percent, the batch may be accepted at a reduced price. The second and third successive batches that deviate from the specified air content by one percent or less, may be accepted at a reduced price. The fourth and all other successive batches that deviate from the specified air content shall be rejected.

(c) Slump. Slump will be determined by AASHTO T 119. Slump acceptance, but not rejection, may be visually determined by the Engineer. During the placement of the concrete, when a batch exceeds the maximum slump specified, the following procedure shall be used to analyze the acceptability of the concrete.

1. Any batch that exceeds the maximum slump specified by more than one inch shall be rejected. Portions of loads incorporated into structures prior to determining test results which indicate rejection as the correct course of action shall be subject to acceptance at reduced price, no payment, or removal as determined by the Engineer.

2. Any batch that exceeds the maximum slump specified by one inch or less, may be incorporated into the project at a reduced price, calculated as follows:

The first batch that exceeds the maximum slump specified by one-half inch or less, may be accepted at full price. If the batch exceeds the maximum slump specified by more than one-half inch and up to one inch, the batch may be accepted at a reduced price. The second and third successive batches that exceed the maximum slump specified by one inch or less, may be accepted at a reduced price. The fourth and all other successive batches that exceed the maximum slump specified shall be rejected.

(d) Pay Factor. The pay factor for concrete which is allowed to remain in place at a reduced price shall be according to the following table and shall be applied to the unit price bid for Item 601, Structural Concrete.

If deviations occur in both air content and slump within the same batch, the pay factor for the batch shall be the product of the individual pay factors.

TABLE 601-2
PAY FACTORS FOR AIR CONTENT AND SLUMP

% Total Air		Slump		Product of Pay Factors	
Deviations From Specified % Air	Pay Factor	Maximum Slump Exceeded by	Pay Factor		
Up to 0.2%	98%	¼"	98%	98X98 = 96%	96X84 = 81%
0.3 -- 0.4%	96%	½"	96%	98X96 = 94%	96X75 = 72%
0.5 -- 0.6%	92%	¾"	92%	98X92 = 90%	92X92 = 85%
0.7 -- 0.8%	84%	1"	84%	98X84 = 82%	92X84 = 77%
0.9 -- 1.0%	75%	over 1"	Reject	98X75 = 74%	92X75 = 69%
over -- 1.0%	Reject			96X96 = 92%	84X84 = 71%
				96X92 = 88%	84X75 = 63%

May 10, 1982

REVISION OF SECTION 608
CONCRETE BIKEWAY

Section 608 of the Standard Specifications is hereby revised to include concrete bikeway for this project as follows:

DESCRIPTION

This work shall consist of the construction of concrete bikeway in accordance with these specifications and in reasonably close conformity with the lines, grades and typical section shown on the plans or established.

MATERIALS

Concrete for bikeway shall be Class A or B and meet the requirements of Section 601. Concrete mixes will be subject to inspection tests as required to assure compliance with quality requirements.

CONSTRUCTION REQUIREMENTS

Concrete bikeway shall be constructed in accordance with subsection 608.03 and to the following:

One-half inch preformed expansion joints shall be placed in the bikeway at intervals of not more than 500 feet. Where the bikeway joins an existing concrete sidewalk, a dummy joint will be formed.

Contraction joints shall be spaced at 10 ft. intervals. They shall be formed by tooling as described in Subsection 608.03(a); by sawing to a depth of 1/4 the slab thickness; or formed by inserting a 20 mil thick polyethylene plastic strip in the wet concrete to a depth of 1/4 the slab thickness.

METHOD OF MEASUREMENT

Concrete bikeway will be measured by the square yard of finished surface.

BASIS OF PAYMENT

The accepted quantities of concrete bikeway will be paid for at the contract unit price per square yard complete in place.

Payment will be made under:

Pay Item	Pay Unit
Concrete Bikeway	Square Yard

All other work necessary and incidental to the construction of concrete bikeway will not be measured and paid for separately but shall be included in the work.

August 30, 1983

REVISION OF SECTION 613
LIGHTING (P.S.CO.)

Section 613 of the Standard Specifications is hereby revised for this project as follows:

Subsection 613.02 shall include the following:

Highway lighting materials and equipment for installations and modifications shall be compatible or interchangeable with standard materials and equipment as stocked by Public Service Co. of Colorado (P.S. Co.).

Lighting materials and equipment that are compatible with that stocked by P.S. Co. are as follows:

Item	Supplier(s)	Catalog Number(s)
Luminaire, 400 Watt HPS (Flat lens)	General Electric ITT	C646N506 25-76242-DJ
Luminaire, 250 Watt HPS	General Electric ITT	C646N521 25-76232-DJ
Coupling, Breakaway	Alcoa Transpo Safety	100-1 5-101T
Skirt, 15" Bolt Circle	KSL Corporation Transpo Safety	SK-15 Order by Description
Foundation, Precast	Arco	Order by State Highway Standard M-613-1

The Engineer will coordinate his review of lighting materials with the Public Service Company.

Subsection 613.08 shall include the following:

At least one grounding electrode shall be installed adjacent to each light standard. Wiring shall be a 120/240 volt or 120/208 volt, 3-wire system with individual luminaires wired for 120 volts.

December 15, 1983

REVISION OF SECTION 614
CONSTRUCTION ZONE TRAFFIC CONTROL DEVICES

Section 614 of the Standard Specifications is hereby revised for this project as follows:

Delete subsections 614.20, 614.21, 614.22, 614.23 and 614.24 and replace with the following:

CONSTRUCTION REQUIREMENTS

614.20 TRAFFIC CONTROL. Traffic control through the construction area is the responsibility of the Contractor. Before starting construction the Contractor shall submit in writing the proposed methods of handling traffic for each of the different stages of construction. The proposed methods shall include, as a minimum, the following:

1. A detailed diagram for the initial construction phase which shows the location of all sign placements, including advance construction signs and speed limit signs; method, length and time duration for lane closures; location of flag persons.

2. A tabulation of all traffic control devices shown in the detailed diagram including, but not limited to: construction signs; vertical panel; vertical panel (with light); Type 1 and Type 2 Barricades; Type 3 Barricades; cones, drum channelizing devices; Concrete Barrier (Temporary); Advance Warning Flashing or Sequencing Arrow Panel.

3. Number of flag persons to be used.

Prior to beginning subsequent phases of work, after the initial phase, the information required in items 1 and 2 above shall be submitted.

Certain traffic control devices may be used for more than one operation or phase. However, all devices required for any particular phase must be detailed and tabulated in that phase.

All proposed methods of handling traffic shall be approved by the Engineer in writing. No traffic control item will be paid for until an acceptable proposal has been received and approved by the Engineer.

Approval of the proposed method of handling traffic is intended to indicate those devices for which payment is to be made, and in no way shall relieve the Contractor of liability specifically provided for in the contract.

614.21 TRAFFIC CONTROL MANAGEMENT.

(a) **When Traffic Control Supervisor is not Paid for Separately.** The Contractor shall, at the preconstruction conference, designate one of his employees, other than the Superintendent, to perform the traffic control management. This performance shall include management of the Contractor's signing and all other details covered by the Plans and Specifications which contribute to the convenience, safety and orderly movement of traffic. The designated employee shall have completed the Division's minimum training requirements for Traffic Control Supervisors within two years prior to starting work on the project. Traffic control management will not be paid for separately but will be included in the work.

(b) **When Traffic Control Supervisor is Paid for Separately.** When a pay item is set up on the plans for Traffic Control Supervisor, the Contractor shall, at the preconstruction confernece, designate someone to be the Traffic Control Supervisor, who shall perform the traffic control management. The Traffic Control Supervisor shall be either; an employee of the Contractor other than the superintendent, or an employee of a firm which has a subcontract for overall traffic control management for the project.

The Traffic Control Supervisor shall have completed the Division's minimum training requirements for Traffic Control Supervisors within two years prior to starting work on the project. The Traffic Control Supervisor's duties shall include:

1. Preparing, revising and submitting the traffic control plan as required.

2. Direct supervision of project Flaggers.

3. Coordinating all traffic control operations, including those of subcontractors and suppliers.

4. Coordinating project activities with appropriate police and fire control agencies.

5. Maintaining a project traffic control diary which shall become a part of the Division's project records.

6. Inspecting traffic control devices on every calendar day that traffic control devices are in use. (By the Traffic Control Supervisor or his approved representative.)

7. Insuring that traffic control devices are functioning as required.

8. Overseeing all requirements covered by the plans and specifications which contribute to the convenience, safety and orderly movement of traffic.

Traffic control management shall be maintained on a 24-hour per day basis. The Contractor shall make arrangements so that the Traffic Control Supervisor or his approved representative will be available on every working day, "on call" at all times and available upon the Engineer's request at other than normal working hours.

The Traffic Control Supervisor shall have an up-to-date copy of part VI of the "Manual on Uniform Traffic Control Devices for Streets and Highways" (MUTCD), pertaining to traffic controls for street and highway construction, available at all times.

614.22 FLAGGING AND PILOT CAR OPERATION. Flagging and pilot car operation shall be performed as described in the latest edition of part VI of the "Manual on Uniform Traffic Control Devices for Streets and Highways" (MUTCD) published by the FHWA.

(a) The Contractor shall provide all flagging through the project necessary to assure proper safety to traffic. All flagging personnel shall have completed the Division's minimum training requirements for flaggers within two years prior to starting work on the project.

(b) Reimbursement for flagging shall be limited to the following areas:

1. The entire construction area under contract and for a distance of 500 feet outside the project limits or approach to project; except that if the project consists of two or more sections, the limits will apply to each section individually.

2. Those areas beyond the above-described limits where the Engineer determines the use of flaggers are necessary to provide adequate warning to traffic.

3. A detour provided on the plans or approved by the Engineer for by-passing all or any portion of the construction irrespective of whether the detour termini are within the project limits.

4. Haul routes to designated materials pits that are shown on the plans. When the materials source is designated on the plans and the Contractor elects to use a different source or a different haul route, the actual cost of flagging resulting from the use of the Contractor's source or haul route will be paid for; except that the cost of flagging in excess of the quantity required by using the designated source will not be paid for.

(c) The cost of all flagging for haul routes from undesignated materials sources to the limits of the project as described in (b) above shall be borne by the Contractor.

(d) The flagger's duties for traffic safety and construction crew safety shall include:

1. Directing traffic.

2. Setting, moving, maintaining and removing temporary traffic control devices required by any flagging operation.

METHOD OF MEASUREMENT

614.23 Quantities to be measured for construction traffic control devices shall be the number of units of the various sizes and descriptions listed below:

Construction Traffic Signs:

Panel Size A: 0.01 to 9.00 Sq. Ft. including Type 1 and Type 2 Barricades.
Panel Size B: 9.01 to 16.00 Sq. Ft.
Panel Size C: 16.01 Sq. Ft. and over.

The total number of traffic control devices of each type on the approved schedule and subsequent modified schedules shall be the maximum number approved for payment.

Traffic channelizing devices consisting of vertical panel, traffic cones, or drum channelizing device will be measured by the Unit. Concrete barriers will be measured by the linear foot. Barricades will be measured by the number used. Barricade warning lights shall be furnished as a part of this Item as required by the Engineer. Advance Warning Flashing or Sequencing Arrow Panels will be measured by the unit according to size.

The quantity to be measured for Traffic Control Supervisor will be the number of authorized 24-hour days performed by the Traffic Control Supervisor or his approved representative. An authorized 24-hour day shall be any day, or portion of a day, authorized by the Engineer, that construction operation would require a Traffic Control Supervisor. "On Call" and project inspections on all other days will not be measured and paid for separately but shall be included in the work.

The quantity to be measured for flagging will be the total number of hours that flagging is actually used as authorized. The quantity to be measured for pilot car operation will be the total number of hours that pilot car operation is used as authorized. Hours of flagging and hours of pilot car operation in excess of those authorized shall be at the Contractor's expense.

BASIS OF PAYMENT

614.24 Payment shall be full compensation for furnishing, erecting, maintaining, moving, removing and disposing of construction traffic control devices necessary to complete the work. All construction traffic control devices which are not permanently incorporated into the project will remain the property of the Contractor.

Construction traffic control devices, as determined by the approved schedule, will be paid for as follows:

50 percent of the contract unit price for the accepted quantity upon first utilization; an additional 40 percent of the contract unit price when 75 percent of the original contract amount has been billed and accepted for payment and the final 10 percent when the project has been completed in accordance with subsection 105.16, exclusive of any maintenance periods.

REVISION OF SECTION 614
CONSTRUCTION ZONE TRAFFIC CONTROL DEVICES

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

Payment will be made under:

PAY ITEM	PAY UNIT
Construction Traffic Sign (Panel Size ____)	Each
Vertical Panel	Each
Vertical Panel (with Light, Flashing)	Each
Vertical Panel (with Light, Steady Burn)	Each
Advance Warning Flashing or Sequencing Arrow Panel (_____ Type)	Each
Drum Channelizing Device	Each
Traffic Cones ____	Each
Concrete Barrier (Temporary)	Linear Foot
Delineator (Type____) (Temporary)	Each
Barricade (Type____)	Each
Traffic Control Supervisor	Day
Flagging	Hour
Pilot Car Operation	Hour

The accepted number of 24-hour days for Traffic Control Supervisor will be paid for at the contract unit price.

Flagger hand signs will not be measured and paid for separately, but shall be included in the work.

If specified on the plan, all costs for making service connections from the power source to the service switch of required traffic control devices, or furnishing a power source, will be paid for in accordance with subsection 109.04. Cost of electrical power, including batteries, for all lighting or warning devices will not be paid for separately but will be considered subsidiary to the item.

The Contractor may provide larger construction traffic signs than those shown on the plans, if approved; however, payment will be made for the panel size designated.

The provisions of paragraphs (c) and (f) of subsection 104.02 do not apply to Traffic Control Supervisor, Flagging, Pilot Car Operation and all other construction zone traffic control devices.

REVISION OF SECTION 620
FIELD FACILITIES

July 1, 1981

Section 620 of the Standard Specifications is hereby revised for this project as follows:

The following is added to Subsection 620.01:

The Contractor shall make arrangements for approved facilities at the site of the hot plant for the purpose of testing hot bituminous pavement mixtures.

Delete Subsection 620.03 and replace with the following:

Field laboratory shall consist of weatherproof, insulated, mobile house-type trailer or other approved structure having equipment similar to the drawings included in this Special Provision and meeting the following minimum requirements:

INSIDE DIMENSIONS: 25' 6" long X 7' 6" wide 7' 0" high.

STEPS: One set for each exit sturdily built of steel, wood or concrete.

DRINKING WATER SUPPLY: Drinking water shall be dispensed from an acceptable water cooling device.

TESTING WATER SUPPLY: 100 gallons, insulated and pressurized by pump, min. 30 psi. delivery pressure.

SHELVING: Minimum of 24 linear feet, 14 inches wide, mounted under work benches.

SINK: 1, with faucet and outside drain.

FIRE EXTINGUISHER: 1, non-toxic, dry chemical, meeting Underwriters Laboratories, Inc. approval for 10 lb Cl. ABC with 20 BC rating.

WORK BENCH: 19' X 30", 36" high.

LIGHTING: Adequate fluorescent lighting directly over all work bench and desk areas. One fluorescent fixture to be located on ceiling inside exhaust hood.

HOTPLATES: 2, two burner, portable, electrical "Cal-Rod" type, with at least one burner in each unit rated 1100 watts. Each hotplate shall be equipped with an on-off indicator light.

SIEVE SHAKER: 1, motor driven, standard portable, capable of handling a set of 8" US standard sieves, mounted 24" above floor in a sound-proof, insulated enclosure having hinged openings.

FLOOR COVERING: Solvent resistant type, 4' X 6', in front of exhaust hood.

TELEPHONE: Minimum flat rate service from nearest exchange.

AIR CONDITIONER: 1, 8300 btu minimum.

FURNITURE: Desk with at least one drawer. One chair with rollers at desk. One stool for work area with height compatible with work bench.

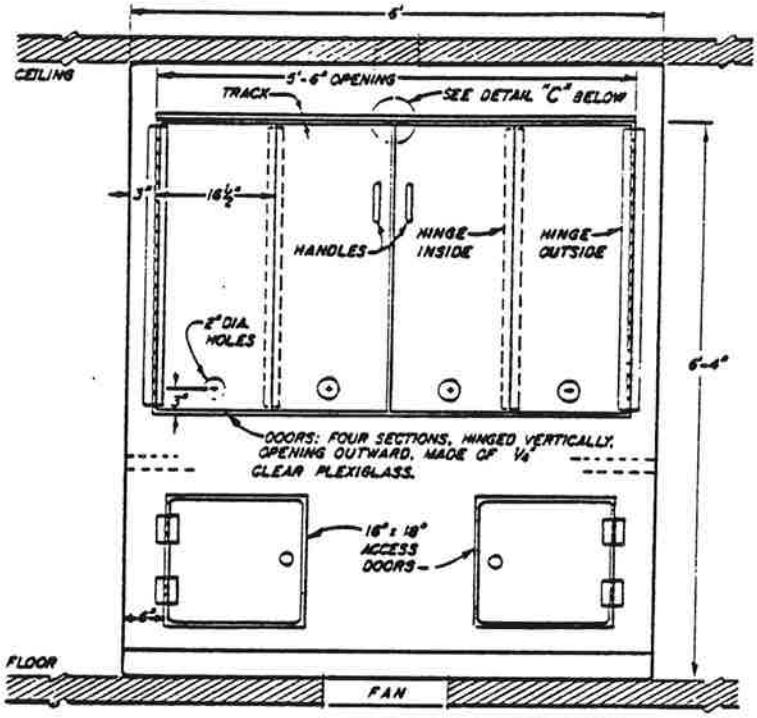
EXHAUST HOOD AND FAN: 1 exhaust hood, 6' wide X 7' high X 30" deep constructed as shown in this Special Provision. Fan shall exhaust to the outside of either the trailer or other approved structure and shall be equipped with variable speed control located outside the hood. Fan shall have a noise level at full speed of less than 10.0 sones, Air Moving and Conditioning Association rating. Exhaust hood shall have an average minimum front face velocity of 100 feet per minute.

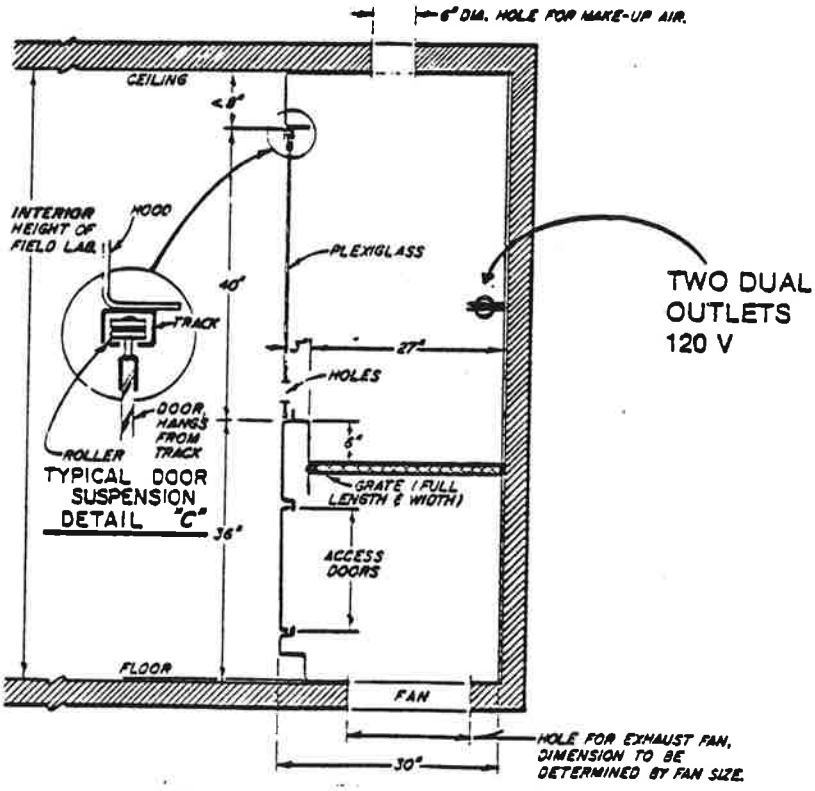
Exhaust hood shall be equipped with a plexiglass, four section door hinged vertically with holes near the bottom as shown hereon.

Exhaust hood shall be equipped with heavy duty grating covered with fine mesh screen (¼ inch openings or less) the full width and length of work bench area. Transite working surface shall be provided as directed.

CONTINUED

— EXHAUST HOOD — FRONT





— EXHAUST HOOD — SIDE

Subsection 620.07 shall include the following:

Facilities for testing hot bituminous paving mixtures at the site of the plant will not be measured nor paid for separately, but shall be included in the work.

SECTION 625
CONSTRUCTION SURVEYING

Section 625 is hereby added to the Standard Specifications and shall include the following:

DESCRIPTION

625.01 This work shall consist of performing construction surveying, calculating, layout and staking necessary for the construction of all elements of the project. The work shall be done under the supervision of a Registered Professional Engineer (P.E.) or Land Surveyor (L.S.) who is experienced and competent in road and bridge construction surveying and registered in the State of Colorado. The P.E. or L.S. shall be available to review work, resolve problems and make decisions in a timely manner.

MATERIALS AND EQUIPMENT

625.02 The Contractor shall furnish all personnel, materials, equipment, and traffic control necessary to perform the required construction surveying. Traffic control shall be in accordance with the requirements of Section 614.

CONSTRUCTION REQUIREMENTS

625.03 General. The Division will establish horizontal and vertical control for the project. All available information defining the extent of that control for this project is provided on the plans and in the Revision to Section 102 of the Project Special Provisions.

Survey procedures shall be in general conformance with the latest edition of the Colorado Department of Highways Survey Manual.

Existing horizontal and vertical control by the Division is preliminary only. The Contractor shall check all Division-established control points, verify their accuracy, and document same prior to using them for his construction survey control.

625.04 Contractor Surveying. The Contractor shall perform all construction surveying and staking that is necessary for construction of the project. Construction surveying and staking shall be based on the survey controls established by the Division.

625.05 Adequate Layout and Staking. The Engineer may require additional Contractor layout, staking or survey control as part of the original bid price if necessary to obtain acceptable completion of the original contract work. Acceptable staking placement intervals for the various construction survey control operations are described in the CDOH Survey Manual. If not therein specified, the staking placement interval shall be as directed.

625.06 Accuracy and Tolerances. Accuracy of surveys and survey tolerances shall be as specified in the plans, specifications or CDOH Survey Manual, and if not therein specified, the accuracy and tolerances shall be as directed. If a discrepancy should occur, the higher degree of accuracy or the more restrictive tolerance shall apply.

625.07 Responsibility and Checking. Supervision and coordination of construction surveying is the Contractor's responsibility. The Engineer may check the Contractor's surveying, however such checking will not relieve the Contractor of any responsibility for accuracy or completeness of his work. All Contractor surveying inaccuracies shall be corrected by the Contractor at no cost to the Division. Engineer's checking or Contractor's corrections shall not be considered reason for additional cost or contract time extension.

625.08 Reset Controls and Stakes. Control points, bench marks and other needed stakes that are damaged, destroyed or made inaccessible by the progress of construction shall be replaced, transferred or re-established by the Contractor as directed, at no cost to the Division.

625.09 Changes. All changes in lines and grades required by field conditions and all discrepancies in grades, alignment, location or dimensions detected by the Contractor shall be immediately brought to the attention of the Engineer. No changes in given data or plans will be allowed unless approved by the Engineer. All changes shall be documented in field survey notebooks.

625.10 Pay Quantities Measurements. The Engineer will perform cross-section surveys and all other interim and final measurements needed to determine contract pay quantities. The Contractor shall maintain control points and stationing as required for these measurements.

625.11 Survey Records. Field survey notes for construction surveying and checking shall be recorded by the Contractor in survey notebooks in general conformance with the format given in the CDOH Survey Manual. An independent check shall be made by the Contractor and shown in the survey notebooks for all bridge layouts. All survey records generated will be considered the property of the Division and shall be available for inspection or reproduction at anytime. All survey notebooks shall be transmitted to the Engineer for inclusion into the project records before final project acceptance.

METHOD OF MEASUREMENT

625.12 Construction surveying will not be measured but will be paid for on a lump sum basis.

BASIS OF PAYMENT

625.13 Payment for construction surveying will be the contract lump sum bid and will be full compensation for all surveying work necessary to complete the project as shown on the plans, to include any resetting of stakes, marks and control points.

Construction surveying required by plan force account or by additional work beyond the scope of the original contract will be paid at the rate established in Section 105. That rate shall also apply to reductions in construction surveying as impacted by reductions or deletions to the original contract work.

Partial payment for construction surveying will be made as the work progresses in accordance with the following:

(1) 20% of the lump sum bid price for construction surveying will be paid when 1% of the original contract amount is earned.

(2) 70% of the lump sum bid price for construction surveying will be paid in direct proportion to the number of working days charged, divided by the original contract time.

(3) The remaining 10% of the lump sum bid price for construction surveying will be paid at the time of project acceptance.

For purposes of this specification, the term "original contract amount" as used above shall mean the amount bid for the construction items on this contract, not including the amounts bid for mobilization and construction surveying.

Payment will be made under:

Pay Item	Pay Unit
Construction Surveying	Lump Sum

Traffic control for construction surveying will be measured and paid for in accordance with Section 614.

February 5, 1986

REVISION OF SECTION 701
HYDRAULIC CEMENT
(SPECIFICATIONS)

Section 701 of the Standard Specifications is hereby revised for this project as follows:

In subsection 701.01, delete the first paragraph and replace with the following:

701.01 **Portland Cement.** Portland cement shall conform to the requirements of the following cited specifications for the type specified or permitted.

Type	Specification
Portland Cement	ASTM C 150
Masonry Cement	ASTM C 91
Blended Hydraulic Cement	ASTM C 595

Type IP blended hydraulic cement may be substituted for portland cement where any type of cement is permitted. Type IP(MS) blended hydraulic cement may be substituted for Type II portland cement.

In determining water/cement ratio (w/c), the cement (c) shall be the sum of the weight of cement and the weight of fly ash.

REVISION OF SECTION 702
BITUMINOUS MATERIALS

Section 702 of the Standard Specifications is hereby revised for this project as follows:

Delete subsections 702.04 and 702.05 and replace with the following:

702.04 Emulsified Asphalts. Emulsified asphalts shall conform to AASHTO M 140 or M 208 for the designated types and grades. When grade CSS-1h or SS-1h emulsified asphalt is used for tack coat. residue penetration test values shall be between 40 and 120.

702.05 Rejuvenating Agents. Asphalt rejuvenating agents shall be composed of a petroleum resin-oil base uniformly emulsified with water and shall conform to the following physical and chemical requirements:

Specification Designation	Test Method	Requirements
Viscosity, S.F., at 77°F, sec.	ASTM D244	15-40
[1]Residue, % min.	ASTM D244	60-65
[2]Miscibility Test	ASTM D244	No coagulation
[3]Sieve Test, % max.	ASTM D244	0.10
Particle Charge Test	ASTM D244	Positive
Tests on Residue from ASTM D244 (Mod):		
Viscosity, cSt, 140°F	ASTM D445	100-200
Asphaltenes, % max.	ASTM D4124	0.75
[4]Maltenes Dist. Ratio $\left\{\frac{PC+A_1}{S+A_2}\right\}$	ASTM D4124	0.3-0.5

[1]ASTM D244 Modified Evaporation Test for percent of residue is made by heating 50-gram sample to 300°F until foaming ceases, then cool immediately and calculate results.
[2]Test procedure identical with ASTM D244 except that .02 Normal Calcium Chloride solution shall be used in place of distilled water.
[3]Test procedure identical with ASTM D244 except that distilled water shall be used in place of 2% sodium oleate solution.
[4]In the Maltenes Distribution Ratio Test by ASTM Method D4124.

PC = Polar Compounds
A_1 = First Acidaffins
A_2 = Second Acidaffins
S = Saturates

702.06 Recycling Agents. Asphalt recycling agents shall conform to the following physical and chemical requirements:

Specification Designation	Test Method	Requirements
Viscosity @ 140°F, cSt	ASTM D2170	200-800
Specific Gravity	ASTM D 70	Report
Flash Point C.O.C., °F min.	ASTM D 92	400
Oven Weight Change, 5 hrs. @ 325°F, % max.	ASTM D1754	4
*Viscosity Ratio, % max.	ASTM D2170	3
Saturates, % max.	ASTM D4124	30

$$\text{*Viscosity Ratio} = \frac{\text{Viscosity after oven wt. change test, measured @ 140°F}}{\text{Original Viscosity @ 140°F}}$$

January 18, 1984

REVISION OF SECTION 703
AGGREGATES FOR CONCRETE

Section 703 of the Standard Specifications is hereby revised for this project as follows:

In subsection 703.01, delete the second sentence and replace with the following:

The amount of material finer than No. 200 sieve shall not exceed 3 percent by dry weight of fine aggregate, when tested in accordance with AASHTO T11 or Colorado Procedure 31, Method D, unless otherwise specified.

In subsection 703.02, delete the fourth sentence and add the following:

Compliance with grading requirements will be based on the combination and not on each individual stockpile.

REVISION OF SECTION 703
AGGREGATE FOR HOT PLANT MIX BITUMINOUS PAVEMENT

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 Aggregate for Hot Plant Mix Bituminous Pavement. Aggregates for hot plant mix bituminous pavement 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.

Reclaimed material shall be of uniform quality. The maximum size of the reclaimed material shall be 1½ inches prior to introduction into the mixer. The maximum aggregate size contained in the combination of reclaimed material and new aggregate shall not exceed the maximum specified in Table 703-1.

The material shall not contain clay balls, vegetable matter, or other deleterious substances. The aggregate for Gradings C, E, and EX shall have a percentage of wear of not more than 45 when tested in accordance with AASHTO T 96.

Table 703-1
MASTER RANGE TABLE FOR HOT BITUMINOUS PAVEMENT

Sieve Designation	Percent by Weight Passing Square Mesh Sieves			
	Grading C	Grading E	Grading EX	Grading F
1"				100
¾"	100	100		
½"	70-95		100	
⅜"	60-88			
#4	44-72	44-72	50-78	
#8	30-58	30-58	34-60	45-85
#50	7-27			
#200	3-12	3-12	3-12	5-15

February 15, 1984

REVISION OF SECTION 708
PAINTS

Section 708 of the Standard Specifications is hereby revised for this project as follows:

Delete subsection 708.05 and replace with the following:

708.05 Pavement Marking Paint. Pavement marking paint shall conform to the requirements listed in the table below. All proportions are by weight. Pigment composition and vehicle composition shall not vary by more than 1.0 percent of each amount specified.

Pigment (White and Yellow): 49.0% to 52.0%

Pigment Composition:	**White**	**Yellow**
Titanium Dioxide, ASTM D-476, Type III	27.0%	8.0%
Chrome Yellow, Medium ASTM D-211, Type III	——	18.0%
Calcium Carbonate, ASTM D-1199, Type GC-II	18.0%	17.0%
Magnesium Silicate, ASTM D-605	54.3%	56.3%
Pigment Suspending Agent (see below)	0.7%	0.7%

Vehicle Composition:	**White & Yellow**
Alkyd Resin Solution, AASHTO, M 248 Type III	70.0%
VM&P Naphtha, Fed. Spec. TT-N-95, Type I	30.0%
Driers, ASTM D-600 cl. B, and Anti-Skinning Agent, Methanol	

Pigment Suspending Agent:

Organo-montmorillonite conforming to subsection 708.06(b) shall be added to achieve the desired storage and stability requirements.

PROPERTIES OF FINISHED PAINT:

The paint at the time of filling shall be free of skins, pigment agglomerates and foreign matter and shall meet the following requirements:

1. Fineness of grind, Hegman — 2 minimum
2. Consistency, Krebs-Stormer, K.U. @ 77°F (25°C) — 70-80
3. Drying time-A wet film of paint 15 mils thick tested according to ASTM Method D-711 — 30 minutes maximum
4. Reflectance - The white paint shall have a daylight 45°, 0° luminous directional reflectance of not less than 80% when compared to magnesium oxide. (ASTM E 97)
5. Color - The yellow paint color shall visually match color chip No. 33538 of Federal Standard 595.

Delete subsection 708.06(d)

July 1, 1983

REVISION OF SECTION 716
WELDED STEEL PIPE

Section 716 of the Standard Specifications is hereby revised for this project as follows:

Delete subsection 716.02 and replace with the following:

716.02 Welded Steel Pipe. Welded steel pipe shall be of the length, diameter, and metal thickness shown on the plans and shall conform to the following.

(a) Pipe shall conform to the applicable requirements of AWWA Standard C 200, Section 3, from steel sheets conforming to ASTM A 570, Grade 33 or 36, plates conforming to ASTM A 283 Grade C or D, or ASTM A 572 Grade 42 or manufactured to meet the requirements of ASTM A 53 Grade B or ASTM A 139 Grade B or C.

(b) Surface Preparation and Coating. Inside and outside surfaces shall be blast cleaned with sand, steel grit, steel shot or a combination of steel grit and steel shot to remove mill scale and rust, in accordance with subsections 509.29(a) and 509.29(b)2. Pipe that is cement mortar lined in accordance with AWWA Standard C205 shall not be blast cleaned. Paint and coating schedule for pipe larger than 10 inch shall conform to the following:

FOR PIPES CARRYING POTABLE WATER

Pipes to be disinfected after installation in accordance with AWWA Standards			
BURIED PIPE		EXPOSED PIPE	
INTERIOR	EXTERIOR	INTERIOR	EXTERIOR
Lined with cement mortar in accordance with AWWA Standard C 205	80 Mil thickness tape coating systems for the exterior of steel water pipelines in accordance with AWWA Standard C 214	Lined with cement mortar in accordance with AWWA Standard C 205 or coal tar epoxy in accordance with Corps of Engineers C-200	Subsections 509.31(a) and (b); 509.32(c), (d) and (f)

FOR PIPES CARRYING NON-POTABLE WATER AND FOR SEWERS

BURIED PIPE		EXPOSED PIPE	
INTERIOR	EXTERIOR	INTERIOR	EXTERIOR
Lined with cement mortar in accordance with AWWA Standard C 205 or coal tar epoxy in accordance with Corps of Engineers C-200	80 Mil thickness tape coating systems for the exterior of steel water pipelines in accordance with AWWA Standard C 214	Lined with cement mortar in accordance with AWWA Standard C 205 or coal tar epoxy in accordance with Corps of Engineers C-200	Subsections 509.31(a) and (b); 509.32(c), (d) and (f)

REVISION OF SECTION 716
WELDED STEEL PIPE

Type of pipe and its coating for pipe 10 inch and smaller shall be as shown on plans.

Bell and spigot ends with rubber gaskets, flanges, mechanical couplings or field welded joints may be used, as conditions require to join the pipe.

All field welds shall conform to Section 509 and shall have linings and coatings replaced equal to the original coating. Wire brushing shall be used where necessary to clean the pipe.

Where cement mortar lining is used with welded joints or bell and spigot ends with rubber gaskets, the joint cut back shall be mortared after the pipe has been laid. This cement mortar lining and application shall conform to AWWA Standard C 205.

On buried pipe coated with a tape coating system conforming to AWWA Standard C-214, the field joints shall be cleaned, primed and wrapped with two thicknesses of 35 mils cold applied elastomeric joint tape conforming to AWWA Standard C 209, Type 11.

Any damage to the pipe lining or coating due to the Contractor's operation shall be repaired at the Contractor's expense.

AFFIRMATIVE ACTION REQUIREMENTS

December 18, 1981

EQUAL EMPLOYMENT OPPORTUNITY

A. AFFIRMATIVE ACTION REQUIREMENTS

Notice of Requirement for Affirmative Action to Ensure Equal Employment Opportunity (Executive Order 11246)

1. The Bidder's attention is called to the "Equal Opportunity Clause" and the "Standard Federal Equal Employment Opportunity Construction Contract Specifications" set forth herein.

2. The goals and timetables for minority and female participation, expressed in percentage terms for the Contractor's aggregate workforce in each trade on all construction work in the covered area, are as follows:

Goals and Timetable for Minority Utilization

Timetable - Until Further Notice

Economic Area	Standard Metropolitan Statistical Area (SMSA)	Counties Involved	Goal
157 (Denver)	2080 Denver-Boulder	Adams, Arapahoe, Boulder, Denver, Douglas, Gilpin, Jefferson	13.8%
	2670 Fort Collins	Larimer	6.9%
	3060 Greeley	Weld	13.1%
	Non SMSA Counties	Cheyenne, Clear Creek, Elbert, Grand, Kit Carson, Logan, Morgan, Park, Phillips, Sedgwick, Summit, Washington & Yuma	12.8%
158 (Colo. Spgs. - Pueblo)	1720 Colorado Springs	El Paso, Teller	10.9%
	6560 Pueblo	Pueblo	27.5%
	Non SMSA Counties	Alamosa, Baca, Bent, Chaffee, Conejos, Costilla, Crowley, Custer, Fremont, Huerfano, Kiowa, Lake, Las Animas, Lincoln, Mineral, Otero, Prowers, Rio Grande, Saguache	19.0%
159 (Grand Junction)	Non SMSA	Archuleta, Delta, Dolores, Eagle, Garfield, Gunnison, Hinsdale, La Plata, Mesa, Moffit, Montezuma, Montrose, Ouray, Pitkin, Rio Blanco, Routt, San Juan, San Miguel	10.2%
156 (Cheyenne-Casper, Wy)	Non SMSA	Jackson County, Colorado	7.5%

GOALS AND TIMETABLES FOR FEMALE UTILIZATION

Until Further Notice ..... 6.9% — Statewide

-continued-

EQUAL EMPLOYMENT OPPORTUNITY

These goals are applicable to all the Contractor's construction work (whether or not it is Federal or federally assisted) performed in the covered area. If the Contractor performs construction work in a geographical area located outside of the covered area, it shall apply the goals established for such geographical area where the work is actually performed. With regard to this second area, the Contractor also is subject to the goals for both its federally involved and non-federally involved construction.

The Contractor's compliance with the Executive Order and the regulations in 41 CFR Part 60-4 shall be based on its implementation of the Equal Opportunity Clause specific affirmative action obligations required by the specifications set forth in 41 CFR 60-4. 3(a), and its efforts meet the goals established for the geographical area where the contract resulting from this solicitation is to be performed. The hours of minority and female employment and training must be substantially uniform throughout the length of the contract, and in each trade, and the Contractor shall make a good faith effort to employ minorities and women evenly on each of its projects. The transfer of minority or female employees or trainees from Contractor to Contractor or from project to project for the sole purpose of meeting the Contractor's goals shall be a violation of the contract, the Executive Order and the regulations in 41 CFR Part 60-4. Compliance with the goals will be measured against the total work hours performed.

3. The Contractor shall provide written notification to the Director of the Office of Federal Contract Compliance Programs within 10 working days of award of any construction subcontract in excess of $10,000 at any tier for construction work under the contract resulting from this solicitation. The notification shall list the name, address and telephone number of the subcontractor; employer identification number; estimated dollar amount of the subcontract; estimated starting and completion dates of the subcontract; and the geographical area in which the contract is to be performed.

4. As used in this specification, and in the contract resulting from this solicitation, the "covered area" is the county or counties shown on the Invitation for Bids and on the plans. In cases where the work is in two or more counties covered by differing percentage goals, the highest percentage will govern.

B. EQUAL EMPLOYMENT OPPORTUNITY

Standard Federal Equal Employment Opportunity Construction Contract Specifications (Executive Order 11246)

1. As used in these Specifications:

   a. "Covered area" means the geographical area described in the solicitation from which this contract resulted;

   b. "Director" means Director, Office of Federal Contract Compliance Programs, United States Department of Labor, or any person to whom the Director delegates authority;

   c. "Employer identification number" means the Federal Social Security number used on the Employer's Quarterly Federal Tax Return, U.S. Treasury Department Form 941.

   d. "Minority" includes:

      (i) Black (all persons having origins in any of the Black African racial groups not of Hispanic origin);

      (ii) Hispanic (all persons of Mexican, Puerto Rican, Cuban, Central or South American or other Spanish Culture or origin, regardless of race);

      (iii) Asian and Pacific Islander (all persons having origins in any of the original peoples of the Far East, Southeast Asia, the Indian Subcontinent, or the Pacific Islands); and

      (iv) American Indian or Alaskan Native (all persons having origins in any of the original peoples of North America and maintaining identifiable tribal affiliations through membership and participation or community identification).

2. Whenever the Contractor, or any Subcontractor at any tier, subcontracts a portion of the work involving any construction trade, it shall physically include in each subcontract in excess of $10,000 the provisions of these specifications and the Notice which contains the applicable goals for minority and female participation and which is set forth in the solicitations from which this contract resulted.

3. If the Contractor is participating (pursuant to 41 CFR 60-4.5) in a Hometown Plan approved by the U.S. Department of Labor in the covered area either individually or through an association, its affirmative action obligations on all work in the Plan area (including goals and timetables) shall be in accordance with that Plan for those trades which have unions participating in the Plan. Contractors must be able to demonstrate their participation in and compliance with the provisions of any such Homestown Plan. Each Contractor or Subcontractor participating in an is individually required to comply with its obligations under the EEO clause, and to make a good faith effort to achieve each goal under the Plan in each trade in which each goal under the Plan in each trade in which it has employees. The overall good faith performance by other Contractors or Subcontractors toward a goal in an approved Plan does not excuse any covered Contractor's or Subcontractor's failure to take good faith efforts to achieve the Plan goals and timetables.

4. The Contractor shall implement the specific affirmative action standards provided in paragraphs 7a through p of these specifications. The goals set forth in the solicitation from which this contract resulted are expressed as percentages of the total hours of employment and training of minority and female utilization the Contractor should reasonably be able to achieve in each construction trade in which it has employees in the covered area. Covered Construction contractors performing construction work in geographical areas where they do not have a Federal or federally assisted construction contract shall apply the minority and female goals established for the geographical area where the work is being performed. Goals are published periodically in the Federal Register in notice form, and such notices may be obtained from any office of Federal Contract Compliance Programs Office or from Federal procurement contracting officers. The Contractor is expected to make substantially uniform progress in meeting its goals in each craft during the period specified.

5. Neither the provisions of any collective bargaining agreement, nor the failure by a union with whom the Contractor has a collective bargaining agreement, to refer either minorities or women shall excuse the Contractor's obligations under these specifications, Executive Order 11246, or the regulations promulgated pursuant thereto.

6. In order for the nonworking training hours of apprentices and trainees to be counted in meeting the goals, such apprentices and trainees must be employed by the Contractor during the training period, and the Contractor must have made a commitment to employ the apprentices and trainees at the completion of their training, subject to the availability of employment opportunities. Trainees must be trained pursuant to training programs approved by the U.S. Department of Labor.

7. The Contractor shall take specific affirmative actions to ensure equal employment opportunity. The evaluation of the Contractor's compliance with these specifications shall be based upon its effort to achieve maximum results from its actions. The Contractor shall document these efforts fully, and shall implement affirmative action steps at least as extensive as the following:

   a. Ensure and maintain a working environment free of harassment, intimidation, and coercion at all sites, and in all facilities at which the Contractor's employees are assigned to work. The Contractor, where possible, will assign two or more women to each construction project. The Contractor shall specifically ensure that all foremen, superintendents, and other on-site supervisory personnel are aware of and carry out the Contractor's obligation to maintain such a working environment, with specific attention to minority or female individuals working at such sites or in such facilities.

   b. Establish and maintain a current list of minority and female recruitment sources, provide written notification to minority and female recruitment sources and to community organizations when the Contractor or its union have employment opportunities available, and maintain a record of the organization's responses.

   c. Maintain a current file of the names, addresses and telephone numbers of each minority and female off-the-street applicant and minority or female referral from a union, a recruitment source of community organization and of what action was taken with respect to each individual. If such individual was sent to the union hiring hall for referral and was not referred back to the Contractor by the union or, if referred, not employed by the Contractor, this shall be documented in the file with the reason therefor, along with whatever additional actions the Contractor may have taken.

   d. Provide immediate written notification to the Director when the union with which the Contractor has a collective bargaining agreement has not referred to the Contractor a minority person or woman sent by the Contractor, or when the Contractor has other information that the union referral process has impeded the Contractor's efforts to meet its obligations.

   e. Develop on-the-job training opportunities and/or participate in training programs for the area which expressly include minorities and women, including upgrading programs and apprenticeship and trainee programs relevant to the Contractor's employment needs, especially those programs funded or approved by the Department of Labor. The Contractor shall provide notice of these programs to the sources complied under 7b above.

   f. Disseminate the Contractor's EEO policy by providing notice of the policy to unions and training programs and requesting their cooperation in assisting the Contractor in meeting its EEO obligations; by including it in any policy manual and collective bargaining agreement; by publicizing it in the company newspaper, annual report, etc., by specific review of the policy with all management personnel and with all minority and female employees at least once a year; and by posting the Contractor's EEO policy on bulletin boards accessible to all employees at each location where construction work is performed.

g. Review, at least annually, the Contractor's EEO policy and affirmative action obligations under these specifications with all employees having any responsibility for hiring, assignment, layoff, termination or other employment decisions including specific review of these items with onsite supervisory personnel such as Superintendents, General Foreman, etc., prior to the initiation of construction work at any job site. A written record shall be made and maintained identifying the time and place of these meetings, persons attending, subject matter discussed, and disposition of the subject matter.

h. Disseminate the Contractor's EEO policy externally by including it in any advertising in the news media, specifically including minority and female news media, and providing written notification to and discussing the Contractors and Subcontractors with whom the Contractor does or anticipates doing business.

i. Direct its recruitment efforts, both oral and written, to minority, female and community organizations, to schools with minority and female students and to minority and female recruitment and training organizations serving the Contractor's recruitment area and employment needs. Not later than one month prior to the date for the acceptance of applications for apprenticeship or other training by any recruitment source, the Contractor shall send written notification to organizations such as the above, describing the openings, screening procedures, and tests to be used in the selection process.

j. Encourage present minority and female employees to recruit other minority persons and women and, where reasonable, provide after school, summer and vacation employment to minority and female youth both on the site and in other areas of a Contractor's workforce.

k. Validate all tests and other selection requirements where there is an obligation to do so under 41 CFR Part 60-3.

l. Conduct, at least annually, an inventory and evaluation at least of all minority and female personnel for promotional opportunities and encourage these employees to seek or to prepare for, through appropriate training, etc. such opportunities.

m. Ensure that seniority practices, job classifications, work assignments and other personnel practices, do not have a discriminatory effect by continually monitoring all personnel and employment related activities to ensure that the EEO policy and the Contractor's obligations under these specifications are being carried out.

n. Ensure that all facilities and Contractor's activities are nonsegregated except that separate or single-user toilet and necessary changing facilities shall be provided to assure privacy between the sexes.

o. Document and maintain a record of all solicitations of offers for subcontracts from minority and female construction contractors and suppliers, including circulation of solicitations to minority and female contractor associations and other business associations.

p. Conduct a review, at least annually, of all supervisor's adherence to and performance under the Contractor's EEO policies and affirmative action obligation.

8. Contractors are encouraged to participate in voluntary associations which assist in fulfilling one or more of their affirmative action obligations (7a through p). The efforts of a contractor association, joint contractor-union contractor-community, or other similar group of which the contractor is a member and participant, may be asserted as fulfilling any one or more of its obligations under 7a through p of these specifications provided that the Contractor actively participates in the group, makes every effort to assure that the group has a positive impact on the employment of minorities and women in the industry, ensures that the concrete benefits of the program are reflected in the Contractor's minority and female workforce participation, makes a good faith effort to meet its individual goal and timetables, and can provide access to documentation which demonstrates the effectiveness of actions taken on behalf of the Contractor. The obligation to comply, however, is the Contractor's and failure of such a group to fulfill an obligation shall not be a defense for the Contractor's noncompliance.

9. A single goal for minorities and a separate single goal for women have been established. The Contractor, however, is required to provide equal employment opportunity and to take affirmative action for all minority groups, both male and female, and all women, both minority and non-minority. Consequently, the Contractor may be in violation of the Executive Order if a particular group is employed in a substantially disparate manner (for example, even though the Contractor has achieved its goals for women generally, the Contractor may be in violation of the Executive Order if a specific minority group of women is underutilized).

10. The Contractor shall not use the goals and timetables or affirmative action standards to discriminate against any person because of race, color, religion, sex, or national origin.

11. The Contractor shall not enter into any Subcontract with any person or firm debarred from Government contracts pursuant to Executive Order 11246.

12. The Contractor shall carry out such sanctions and penalities for violation of these specifications and of the Equal Opportunity Clause, including suspension, termination and cancellation of existing subcontracts as may be imposed or ordered pursuant to Executive Order 11246, as amended, and its implementing regulations, by the Office of Federal Contract Compliance Programs. Any Contractor who fails to carry out such sanctions and penalties shall be in violation of these specifications and Executive Order 11246, as amended.

13. The Contractor in fulfilling its obligations under these specifications, shall implement specific affirmative action steps, at least as extensive as those standards prescribed in paragraph 7 of these specifications, so as to achieve maximum results from its efforts to ensure equal employment opportunity. If the Contractor fails to comply with the requirements of the Executive Order, the implementing regulations, or these specifications, the Director shall proceed in accordance with 41 CFR 60-4.8.

14. The Contractor shall designate a responsible official to monitor all employment related activity to ensure that the company EEO policy is being carried out, to submit reports relating to the provisions hereof as may be required by the Government and to keep records. Records shall at least include for each employee the name, address, telephone numbers, construction trade, union affiliation if any, employee identification number when assigned, social security number, race, sex, status (e.g., mechanic, apprentice, trainee, helper, or laborer), dates of changes in status, hours worked per week in the indicated trade, rate of pay, and locations at which the work was performed. Records shall be maintained in an easily understandable and retrievable form, however, to the degree that existing records satisfy this requirement, Contractors shall not be required to maintain separate records.

15. Nothing herein provided shall be construed as a limitation upon the application of other laws which establish different standards of compliance or upon application of requirements for the hiring of local or other area residents (e.g., those under the Public Works Employment Act of 1977 and the Community Development Block Grand Program).

EQUAL EMPLOYMENT OPPORTUNITY

16. Records and Reports

a. The contractor will keep such records as are necessary to determine compliance with the contractor's equal employment opportunity obligations. The records kept by the contractor will be designed to indicate:

(1) the number of minority and nonminority group members and women employed in each work classification on the project.

(2) the progress and efforts being made in cooperation with unions to increase employment opportunities for minorities and women (applicable only to contractors who rely in whole or in part on unions as a source of their work force),

(3) the progress and efforts being made in locating, hiring, training, qualifying, and upgrading minority and female employees, and

(4) the progress and efforts being made in securing the services of minority group subcontractors or subcontractors with meaningful minority and female representation among their employees.

b. All such records must be retained for a period of three years following completion of the contract work and shall be available at reasonable times and places for inspection by authorized representatives of the Division and the Federal Highway Administration.

c. The contractors will submit an annual report to the Division each July for the duration of the project, indicating the number of minority, women, and non-minority group employees currently engaged in each work classification required by the contract work. This information is to be reported on Form PR 1391. If on-the-job training is required, the contractor shall furnish Form FHWA 1409.

September 1, 1983

ERRATA TO THE 1981 STANDARD SPECIFICATIONS

The Standard Specifications are hereby revised as follows:

Page vi	Table of contents; following the 106.04 item, change the word "insection" to "inspection"
Page 104	Subsection 109.06; in the last paragraph on page 104, first sentence, change the reference to the Colorado Revised statutes from 24-01-105 to 24-91-105.
Page 163	Subsection 212.06; first sentence, first and second lines; change the word "unirregated" to "unirrigated."
Page 247	Subsection 403.05; change the pay item "Hot Bituminous Pavement (Patching) (Haul)" to "Hot Bituminous Pavement (Patching)".
Page 268	Subsection 412.04(e); in the third line from the bottom of the page, change the first word on the line from "payment" to pavement"
Page 382	Subsection 509.25(c), 2nd paragraph, 6th line; change the reference to subsection 509.25(f) to 509.25(g).
Page 394	Subsection 509.29(b)2 change the first sentence following the italicized title to read: "The steel shall be cleaned by either the centrifugal wheel or the air blast method."
Pages 466, and 468	Subsection 601.11; 2nd full paragraph from top of page 466, next to last line and also last line on the page. Change f'c to fc. Make the same change in the 6th line of subpart(e) on page 468.
Page 604	Subsection 614.21; change the italicized title of (a) to read; "Traffic Control Management When 'Traffic Control Supervisor' Is Not Paid for Separately." Also change the italicized title of (b) to read "Traffic Control Management When 'Traffic Control Supervisor' Is Paid for Separately."
Page 614	Subsection 616.09; in the Pay Item - Pay Unit Table, following "Concrete Siphon Pipe" delete (class_____)
Page 675	Subsection 627.02, in the third line of the subsection delete the reference to subsection 708.07.
Page 691	Section 703; in the Concrete Aggregate Gradation Table, first column headed "sieve size", change the first entry to 2½" instead of 2".
Page 726	Subsection 707.07, last line; change the reference to "AASHTO M 197" to "AASHTO M 196."
Page 765	Subsection 713.12; delete the reference to AASHTO M 250

July 29, 1985

INCENTIVE BONUS
FOR MBE SUBCONTRACT WORK

An incentive payment will be made to the Contractor for work that is contracted to DBEs in accordance with the following:

1. To be eligible for incentive payment, the Contractor shall have contracted work to DBEs and WBEs equal to or greater than each of their respective contract goals. The dollar amount of the work contracted to DBEs and WBE s will be the actual contract dollar totals reported to the Division on DOH Form No. 713.

   Only contracted work that complies with, (d) Counting MBE Participation Toward Goals, of the Standard Special Provision titled "Minority Business Enterprise Definitions and Requirements" will be counted toward the respective contract goals.

2. Incentive payment will be equal to 10% of that portion of the actual dollar payment made to DBEs that exceeds the dollar amount obtained by multiplying the contract goal percentage for DBE by the original prime contract amount.

3. Incentive payment will be included in the final payment to the Contractor. However, before the incentive payment is made, the Contractor shall certify the dollar amount of payment(s) to DBEs and WBEs on DOH Form No. 17. This certification shall include a co-signature by each DBE and WBE and may be audited by the Division.

4. The total value of incentive payment will not exceed $21,000.

MINIMUM WAGES COLORADO, U.S. DEPT. OF LABOR DECISION NO. CO86-1
HEAVY AND HIGHWAY CONSTRUCTION, STATEWIDE

Decision No. CO86-1 dated Jan. 3, 1986
supersedes Decision No. CO85-5021
dated April 12, 1985

Modifications

Mod. 1, 2-7-86, errata	1
Mod. 2, 3-21-86, pages 1, 9	2
Mod. 3, 3-28-86, pages 1, 2	3
Mod. 4, 4-11-86, errata	4
Mod. 5, 4-25-86, page 3	5
Mod. 6, 5-2-86, pages 1, 2	6
Mod. 7, 5-23-86, errata	7
Mod. 8, 6-13-86, page 3	8

Code	Classification	Basic Hourly Rate	Fringe Benefits	
2	CARPENTERS	$13.15	$ 3.22	6
3B	CEMENT MASONS	12.04	2.79	
	ELECTRICIANS:			
	Area 1:			
4	Electricians	16.85	2.10+ 3.3%	
5	Cable Splicers	17.10	2.10+ 3.3%	
	Area 2:			
6	Electricians	16.00	1.50+ 4%	
7	Cable Splicers	16.25	1.50+ 4%	
	Area 3:			
	Contracts over $100,000.00:			
55	Electricians	15.49	2.00+ 4.5%	
56	Cable Splicers	17.04	2.00+ 4.5%	
57	Electricians on electrical contracts less than $100,000.00	11.50	1.80+ 4.5%	
	Area 4:			
14	Electricians	16.12	2.31+ 3%	
	IRONWORKERS:			
18	Structural, Ornamental & Reinforcing	16.00	3.53	3
	LINE CONSTRUCTION:			
106	Cable Splicers	18.55	2.00+ 3%	
108	Journeyman Lineman, Gas Fitter Welder	16.88	2.00+ 3%	
109	Line Equipment Operator, Line Truck Crew Class 1	13.33	2.00+ 3%	
111A	Groundman	10.28	2.00+ 3%	
	PAINTERS:			
	Area 1:			
19	Brush	14.92	2.33	
20	Spray, Swing Stage	15.52	2.33	
	Area 2:			
21	Brush	13.01	1.88	
22B	Spray, Swing Stage	13.61	1.88	
	Area 3			
24	Brush	11.92	1.88	
25A	Spray, Swing Stage	12.52	1.88	
	PLUMBERS			
26A	Montezuma County	17.45	2.65	

Code	Classification	Basic Hourly Rate	Fringe Benefits	
	LABORERS:			
112	Flaggers/Traffic Directors	$ 6.40	$ 2.59	6
113	Group 1	9.55	2.59	6
114	Group 2	9.60	2.59	6
115	Group 3	10.10	2.59	6
	TUNNEL LABORERS:			
118	Group 1	9.55	2.59	6
119	Group 2	10.45	2.59	6
120	Group 3	10.55	2.59	6
121	Group 4	10.65	2.59	6
122	Group 5	10.70	2.59	6
123	Group 6	11.60	2.59	6
	SHAFTS, RAISES, MISSILE SILOS AND ALL UNDERGROUND WORK OTHER THAN TUNNELS:			
124	Group 1	10.55	2.59	6
125	Group 2	10.70	2.59	6
126	Group 3	10.80	2.59	6
127	Group 4	11.05	2.59	6
128	Group 5	11.15	2.59	6
129	Group 6	11.75	2.59	6

Code	Classification	Basic Hourly Rate ZONE 1	Basic Hourly Rate ZONE 2	
	POWER EQUIPMENT OPERATORS: (Other than for work in Tunnels, Shafts, and Raises):			
130	Group 1	$ 11.71	$ 12.38	3
131	Group 2	12.06	12.73	3
132	Group 3	12.41	13.08	3
133	Group 4	12.56	13.23	3
134	Group 5	12.71	13.38	3
135	Group 6	12.86	13.53	3
	(For work in Tunnels, Shafts, and Raises):			
136	Group 1	13.86	14.53	3
137	Group 2	14.21	14.88	3
138	Group 3	14.31	14.98	3
139	Group 4	14.56	15.23	3
140	Group 5	14.71	15.38	3
141	Group 6	15.11	15.78	3
142	Group 7	14.86	15.53	3

FRINGE BENEFITS: $3.70 per hour

Code	Classification	Basic Hourly Rate ZONE 1	Basic Hourly Rate ZONE 2	
	TRUCK DRIVERS:			
28	Group 1	$ 13.61	$ 12.88	8
29	Group 2	13.71	13.01	8
30	Group 3	13.81	13.14	8
31	Group 4	13.91	13.21	8
32	Group 5	15.51	13.26	8
92	Group 6	15.56	13.33	8
34	Group 7	15.61	13.38	8
93	Group 8	15.66	13.45	8
94	Group 9	15.71	13.58	8
38	Group 10	15.76	13.64	8
39	Group 11	15.86	13.76	8
40	Group 12	15.91	14.01	8
41	Group 13	16.01	14.06	8
36	Group 14	16.16	14.13	8
42	Group 15	16.21	14.27	8
95	Group 16	16.31	14.51	8
43	Group 17	16.41	14.77	8
44	Group 18	16.51	15.51	8
45	Group 19	16.61	15.76	8
46	Group 20	16.81	-	8

FRINGE BENEFITS: $3.64 per hour

WELDERS - receive rate prescribed for craft performing operation to which welding is incidental.

Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29 CFR, 5.5(a)(1)(ii)).

ELECTRICIANS:

Area 1: Adams, Arapahoe, Boulder, Clear Creek, Denver, Douglas, Eagle, Gilpin, Grand, Jackson, Jefferson, Lake, Larimer, Logan, Morgan, Phillips, Sedgwick, Summit, Washington, Weld and Yuma Counties.

Area 2: Delta, Dolores, Garfield, Gunnison, Hinsdale, La Plata, Mesa, Moffat, Montezuma, Montrose, Ouray, Pitkin, Rio Blanco, Routt, San Juan and San Miguel Counties.

Area 3: Alamosa, Archuleta, Baca, Bent, Chaffee, Crowley, Custer, Fremont, Huerfano, Kiowa, Las Animas, Mineral, Otero, Prowers, Pueblo, Rio Grande and Saguache Counties.

Area 4: Cheyenne, Elbert, El Paso, Kit Carson, Lincoln, Park and Teller Counties.

PAINTERS:

Area 1: Adams, Arapahoe, Boulder, Clear Creek, Delta, Denver, Douglas, Eagle, Elbert, Garfield, Gilpin, Grand, Gunnison, Jackson, Jefferson, Lake, Larimer, Logan, Mesa, Moffat, Montrose, Morgan; Park County (northern half); Phillips, Pitkin, Rio Blanco, Routt, Sedgwick, Summit, Washington and Weld Counties.

Area 2: Baca, Bent, Crowley, Costilla, Custer, Huerfano, Kiowa, Las Animas, Otero, Prowers and Pueblo Counties.

Area 3: Alamosa, Archuleta, Chaffee, Cheyenne, Dolores, El Paso, Fremont, Hinsdale, Kit Carson, La Plata, Lincoln, Mineral, Montezuma, Ouray; Park County (southern half); Rio Grande, Saguache, San Juan, San Miguel and Teller Counties.

LABORERS:

Group 1: Minimum labor, including caissons to 8'; carrying reinforcing rods; dowel bars; fence erectors; fire watcher on power plants and oil refineries; gabion basket and reno mattresses; signaling, metal mesh; mursery man, including seeding; mulching and planting trees; pipe plants and yards; schrubs and flowers; stake chaser; tie bar and chairs in concrete, paving, waterproofing concrete.

Group 2: Air, gas, hydraulic tools and electrical tool operators; barco hammers; cutting torches; drill; diamond and core drills; electric hammers; jackhammers; hydraulic jacks; tampers; air tampers; boring machines; air hydraulic boring machines; automatic concrete power curbing machines; concrete processing material; form-setters; highways, streets, and airports runways; operators of concrete saws on pavement (other than gangsaws); power operated concrete buggies; hot asphalt labor; asphalt curb machines; paving breakers; transverse concrete conveyor operator; cofferdams; boxtenders; caissons 8' to 12'; caissons over 12'; jackhammer operators in caissons over 12'; labor applicable to pipe coating or wrapping; pipe wrappers, plant and yard; relining pipe; hydroliner (a plastic may be used to waterproof); pipelayer on underground bores; sewer, water, gas, oil and telephone conduit; enamalers or pipe, inside and out, mechanical grouters; monitors; jeep holiday detector men; pump operators, rakers; vibrators; hydro-broom, mixer man; gunnite nozzelmen; shotcrete operator; timbermen, timber and chain saws; sand blasters; licensed powdermen; powdermen and blasters; siphons; signalmen.

Group 3: Plug and galleys in dams; scalers; and work on or off bridges 40' above the ground performed by laborers' working from a bos'n chair, swinging stage, life belt, or block and tackle as a safety requirement. All lines and safety belts used shall be of a type approved by state and federal laws.

LABORERS (TUNNEL):

Group 1: Outside Labor.

Group 2: Minimum Tunnel Labor, Dry Houseman.

Group 3: Cable or Hose Tenders, Chuck Tenders, Concrete Laborers, Dumpmen, Whirley Pump Operators.

Group 4: Tenders on Shotcrete, Gunniting and Sand Blasting; Tenders, Core and Diamond Drills; Pot Tenders.

Group 5: Cement Finisher Tender, applying of concrete processing materials.

Group 6: Collapsable Form Movers and Setters, Miners, Machine Men and Bit Grinders, Nippers, Powdermen and Blasters, Reinforcing Steel Setters, Timbermen (steel or wood tunnel support, including the placement of sheeting when required) and all cutting and welding that is incidental to the Miner's work; Tunnel Liner Plate Setters; Vibrator Men, internal and external; Unloading, stopping and starting of Moran Agitator Cars; Diamond and Core Drill Operators; Cement Finisher (underground); Shotcrete Operator; Gunnite Nozzlemen, Sand Blasters, Pump Concrete Placement Men.

LABORERS (Shafts, Raises, Missile Silos and All Underground Work other than Tunnels):

Group 1: Laborers, Topmen, Bottommen and Cagers.

Group 2: Chucktenders, Concrete Laborors, Whirley Pump Operators.

Group 3: Tenders in Shotcrete Gunniting and Sand Blasting; Tenders on Core and Diamond Drills; Pot Tenders; Cement Finisher Tenders, applying concrete processing materials.

Group 4: Diamond and Core Drill Operators; Cement Finisher (underground); Gunnite Nozzlemen; Shotcrete Operators; Sand Blasters and Pump Concrete Placement Men.

Group 5: Any employee performing work underground from a Bos'n Chair, Swinging Stage, Life Belt or Block and Tackle as a safety requirement. All lines and safety belts used shall be of a type approved by State and Federal Laws.

Group 6: Collapsable Form Movers and Setters, Miners, Machine Men and Bit Grinders, Nippers, Powdermen and Blasters, Reinforcing Steel Setters, Timbermen (steel or wood tunnel) support, including the placement of sheeting when required) and all cutting and welding that is incidental to the Miner's work; Liner Plate Setters; Vibrator Men, internal and external.

POWER EQUIPMENT OPERATORS - ZONE DEFINITIONS

Counties entirely within Zone 1:

Alamosa	Conejos	Douglas	Jefferson	Morgan	Sedgwick
Archuleta	Costilla	El Paso	La Plata	Otero	Teller
Bent	Crowley	Fremont	Larimer	Phillips	Weld
Boulder	Custer	Garfield	Logan	Prowers	
Chaffee	Delta	Gilpin	Mesa	Pueblo	
Clear Creek	Denver	Huerfano	Montezuma	Rio Grande	

Counties entirely within Zone 2:

Baca	Gunnison	Kit Carson	Moffat	Rio Blanco	San Miguel
Cheyenne	Hinsdale	Lake	Ouray	Routt	Summit
Dolores	Jackson	Lincoln	Park	Saguache	Yuma
Grand	Kiowa	Mineral	Pitkin	San Juan	

Legal description of the portions of Adams, Arapahoe, Eagle, Elbert, Las Animas, Montrose, and Washington Counties which are included within Zone 1, as follows:

All of Adams, Arapahoe, Elbert and Las Animas Counties lying west of the Township Line between R59W and R60W of the 7th Guide Meridian West; and all of Eagle County lying west of the Township line between R80W and R81W of the North line of Ouray County and said North line extended west to the Township line between R11W and R12W, said part lying east of said Township Line of the New Mexico Principal Meridian, and all of Washington County lying north of the 40 degree 00 minutes 00 seconds Latitude Base Line.

Legal description of the portions of Adams, Arapahoe, Eagle, Elbert, Las Animas, Montrose and Washington Counties which are included within Zone 2, as follows:

All of Adams, Arapahoe, Elbert and Las Animas Counties lying east of the Township Line between R59W and R60W of the 7th Guide Meridian West, and all of Eagle County lying East of the Township Line between R80W and R81W of the 9th Guide Meridian West, and all of Montrose County except that part lying Northerly of the North Line of Ouray County and said North line extended west to the Township line between R11W and R12W, said point being East of said Township Line of the New Mexico Principal Meridian, and all of Washington County lying South of the 40 degree 00 minutes 00 seconds Latitude Base Line.

POWER EQUIPMENT OPERATORS
(Other than for work in Tunnels, Shafts and Raises)

Group 1: Air Compressor; Asphalt Screed; Oiler; Brakeman; Drill Operator - smaller than Williams MF and similar; Tender to Heavy Duty Mechanic and/or Welder; Operators of 5 or more light plants, Welding Machines, Generators, single unit conveyor; Pumps; Vacuum Well Point System; Tractor, under 70 HP with or without attachments, Grade Checker; Compressors, 360 C.F.M. or less.

Group 2: Conveyor, handling building materials; Ditch Witch and similar Trenching Machine; Fireman or Tank Heater, road; Forklift; Haulage Motor Man; Pugmill; Portable Screening Plant with or without a spray bar; Screening Plants, with classifier; Self-propelled Roller, rubber-tired under 5 tons.

POWER EQUIPMENT OPERATORS (continued)
(Other than for work in Tunnels, Shafts and Raises)

Group 3: Asphalt Plant; Backfiller, Bituminous Spreader or Laydown Machine; Cableway Signalman; Caisson Drill; Williams MF, similar and larger; C.M.I. and similar; Concrete Batching Plants; Concrete Finish Machine; Concrete Gang Saws on concrete paving; Concrete Mixer, less than 1 yd.; Concrete Placement Pumps, under 8 inches; Distributors, Bituminous Surfaces; Drill, Diamond or Core; Drill Rigs, Rotary, Churn, or Cable Tool; Elevating Graders, Equipment Lubricating and service Engineer; Engineer Fireman; Grout Machine; Gunnite Machine; Hoist, 1 drum; Hydraulic Backhoes, wheel mounted under 3/4 yd.; Loader, Barber Green, etc.; Loader up to and including 6 cu. yds.; Machine Doctor; Mechanic; Motor Grader/Blade, rough; Road Stabilization Machine; Rollers, self-propelled, all types over 5 tons; Sandblasting Machine; single unit portable crusher, with or without washer; Tie Tamper, wheel mounted; Tractor, 70 HP and over with or without attachments; Trenching Machine Operator; Welder; Winch on truck.

Group 4: Cable operated Crane, truck mounted; Cable operated power Shovels, Draglines, Clamshells and Backhoes, 5 cu. yds. and under; Concrete Mixer over 1 cu. yd.; Concrete Paver 34E or similar; Concrete Placement Pumps, 8 in. and over; Crane, 50 tons and under; Hoist, two drums; Hydraulic Backhoe, 3/4 yd. and over; Loader, over 6 cu. yds.; Mechanic-welder, heavy duty; Mixer Mobile; Motor Grader/blade, finish; Multiple unit portable Crusher, with or without washer; Piledriver; Scrapers, single bowl under 40 cu. yds.; Self-propelled Hydraulic Crane; Tractor with sideboom; Truck mounted Hydraulic Crane.

Group 5: Cable operated power Shovels, Draglines, Clamshells and Backhoes over 5 cu. yds.; Crane, over 50 tons carrier mounted; Derrick; Electric rail type Tower Crane; Hoist, 3 drum or more; Quad Nine and similar push unit; Scrapers single bowl including pups 40 cu. yds. and tandem bowls and over.

Group 6: Cableway; Climbing Tower Crane; Crawler or truck mounted Tower Crane; Wheel Excavator, Tower Crane, truck type.

POWER EQUIPMENT OPERATORS
(For work in Tunnels, Shafts and Raises)

Group 1: Brakeman.

Group 2: Motorman.

Group 3: Compressor (900 CFM and over) serving Tunnels, Shafts and Raises.

Group 4: Air Tractors; Grout Machine; Gunnite Machine; Jumbo Form; Mechanic; Welder.

Group 5: Concrete Placement Pumps, 8" and over discharge; Mucking Machines and Front End Loaders, underground, Slusher; Mine Hoist Operator.

Group 6: Mole.

Group 7: Mechanic - Welder, heavy duty.

TRUCK DRIVERS - ZONE DEFINITIONS

COUNTIES WITHIN ZONE 1:

Alamosa, Archuleta, Baca, Bent, Cheyenne, Conejos, Costilla, Crowley, Dolores, Eagle, Grand, Gunnison, Hinsdale, Jackson, Kiowa, Kit Carson, Lake, LaPlata, Lincoln, Logan, Mineral, Moffat, Montezuma, Morgan, Otero, Ouray, Park, Phillips, Pitkin, Prowers, Rio Blanco, Rio Grande, Routt, Saguache, San Juan, San Miguel, Sedgewick, Summit, Yuma, Washington.

COUNTIES WITHIN ZONE 2:

Adams, Arapahoe, Boulder, Chaffee, Clear Creek, Custer, Delta, Denver, Douglas, Elbert, El Paso, Fremont, Garfield, Gilpin, Huerfano, Jefferson, Larimer, Las Animas, Mesa, Montrose, Pueblo, Teller and Weld.

TRUCK DRIVERS ZONE 1

Group 1: Pickup, Truck Driver Tenders, Dumpmen, Washers, Greasemen.

Group 2: Dump Truck driver to including 6 cubic yard, sweeper truck, Flat rack single axle, and manhaul, shuttle truck or bus, liquid and bulk tankers - single axle.

Group 3: Flat rack tandem axle battery men, mechanics' tenders.

Group 4: Fork lift driver.

Group 5: Dump Truck driver over 6 cubic yards, to and including 14 cubic yards.

Group 6: Straddle truck driver, lumber carrier, liquid and bulk tankers-tandem axle.

Group 7: Truck drivers-fuel truck, grease truck, combination fuel and grease.

Group 8: Cement mixer - agitator truck to and including 10 cubic yards, Distributor truck driver Liquid and bulk tankers-semi or combination.

Group 9: Multi purpose truck-specialty and hoisting.

Group 10: Dump truck driver over 14 cubic yards, to and including 29 cubic yards, Highboy, lowboy, floats, semi Cab operated distributor truck driver - semi Liquid and bulk tankers-Euclid-Electric or similar Truck Driver dumptor type, Youngbuggy, Jumbo and similar type equipment.

Group 11: Truck driver, snow plow.

Group 12: Cement Mixer - agitator truck, over 10 cubic yards, to and including 15 cubic yards.

Group 13: Dump truck driver over 29 cubic yards, to and including 39 cubic yards.

Group 14: Cement mixer - agitator truck over 15 cubic yards.

Group 15: Tire man Dump truck driver over 39 cubic yards, to and including 54 cubic yards.

Group 16: Mechanic.

Group 17: Dump truck driver over 54 cubic yards, to and including 79 cubic yards.

Group 18: Heavy duty diesel mechanic, body men, welders or combination men.

Group 19: Dump truck driver over 79 cubic yards, to and including 104 cubic yards.

Group 20: Dump truck driver over 104 cubic yards.

TRUCK DRIVERS ZONE 2

Group 1: Pick up, truck driver tenders, Dumpmen, Greasemen.

Group 2: Dump truck driver to including 6 cubic yard, sweeper truck, Flat rack single axle, and manhaul, shuttle truck or bus Liquid and bulk tankers - single axle.

Group 3: Flat rank tanden axle Battery men, mechanics tenders Liquid and bulk tankers - tandem axle Dump truck driver over 6 cubic yards, to and including 14 cubic yards.

Group 4: Straddle truck driver, lumber carrier.

Group 5: Fork lift driver Truck drivers-fuel truck, grease truck, combination fuel.

Group 6: Cement mixer - agitator truck to and including 10 cubic yards, Distributor truck driver.

Group 7: Multi purpose truck - specialty and hoisting.

Group 8: Dump truck driver over 14 cubic yards, to and including 29 cubic yards, cab operated distributor truck driver - semi Liquid and bulk tankers - Euclid - Electric or similar Truck Driver dumptor type, Youngbuggy, Jumbo and similar type equipment Liquid and bulk tankers - semi or combination (Water truck drivers required to puddle-rate plus 10 cents.).

Group 9: Truck driver, snow plow.

Group 10: Cement mixer - agitator truck over 10 cubic yards, to and including 15 cubic yards.

Group 11: Dump truck driver over 29 cubic yards, to and including 39 cubic yards.

Group 12: Tire man Dump truck driver over 39 cubic yards, to and including 54 cubic yards.

Group 13: Cement mixer - agitator truck over 15 cubic yards.

Group 14: Mechanic.

Group 15: Dump truck driver over 54 cubic yards, to and including 79 cubic yards.

Group 16: Dump truck driver over 79 cubic yards, to and including 104 cubic yards.

Group 17: Dump truck driver over 104 cubic yards.

Group 18: Heavy duty diesel mechanic, body men, welders or combination men.

Group 19: Highboy, Lowboy, Floats, Semi. 2

July 29, 1985

MINORITY BUSINESS ENTERPRISE DEFINITIONS AND REQUIREMENTS

(a) Definitions

For the purpose of this Special Provision the following terms are defined:

1. Minority Business Enterprise (MBE). A small business concern, as defined pursuant to Section 3 of the Small Business Act and implementing regulations, which is owned and controlled by one or more minorities or women, and certified by the Department as being:

   A. At least 51 percent owned by one or more minorities or women or, in the case of a publicly owned business, at least 51 percent of the stock of which is owned by one or more minorities or women; and

   B. Whose management and daily business operations are controlled by one or more such individuals.

   C. "Minority" means a person who is a citizen or lawful permanent resident of the United States and who is:

      (1) Black (A person having origins in any of the Black racial groups of Africa);
      (2) Hispanic (A person of Spanish or Portuguese culture with origins in Mexico, South or Central America, or the Caribbean Islands, regardless of race);
      (3) Asian American (A person having origins in any of the original peoples of the Far East, Southeast Asia, the Indian subcontinent, or the Pacific Islands); or
      (4) American Indian and Alaskan Native (A person having origins in any of the original peoples of North America).
      (5) Members of other groups or other individuals, found to be economically and socially disadvantaged by the Small Business Administration under Section 8(a) of the Small Business Act, as amended (15 U.S.C. 637(a)).

2. Disadvantaged Business Enterprise (DBE). A small business concern that is certified by the Department as being:

   A. At least 51 percent owned by one or more socially and economically disadvantaged individuals or, in the case of any publicly owned business, at least 51 percent of the stock of which is owned by one or more socially and economically disadvantaged individuals; and

   B. Whose management and daily business operations are controlled by one or more of the socially and economically disadvantaged individuals who own it.

   C. "Socially and Economically Disadvantaged Individuals" means those individuals who are citizens or lawfully admitted permanent residents of the United States and who are:

      (1) "Black Americans," which includes persons having origins in any of the Black racial groups of Africa;
      (2) "Hispanic Americans," which includes persons of Mexican, Puerto Rican, Cuban, Central or South American, or other Spanish culture or origin, regardless of race;
      (3) "Native Americans," which includes persons who are American Indians, Eskimos, Aleuts, or Native Hawaiians;
      (4) "Asian-Pacific Americans," which includes persons whose origins are from Japan, China, Taiwan, Korea, Vietnam, Laos, Cambodia, the Phillippines, Samoa, Guam, The U.S. Trust Territories of the Pacific, and the Northern Marianas: and
      (5) "Asian-Indian Americans," which includes persons whose origins are from India, Pakistan, and Bangladesh.
      (6) Any other minorities or individuals found to be disadvantaged by the Small Business Administration pursuant to Section 8(a) of the Small Business Act.

MINORITY BUSINESS ENTERPRISE
DEFINITIONS AND REQUIREMENTS

3. Women Business Enterprise (WBE). A small business concern that is certified by the Department as being:

   A. At least 51 percent owned by one or more women, or in the case of a publicly owned business, at least 51 percent of the stock of which is owned by one or more women; and

   B. Whose management and daily business operations are controlled by one or more such women.

4. MBE Joint Venture. Means an association of two or more businesses formed to carry out a single business enterprise for profit for which purposes they combine their property, capital, efforts, skills and knowledge. MBE joint ventures must be certified as a joint venture by the Department.

   A. For those projects set-aside for bidding by DBEs only; all of the partners in a joint venture must be DBEs and certification of the joint venture will not be required.

   B. For all projects other than the set-aside projects discussed in A. above; one of the partners in a joint venture must be an MBE. The MBE percentage of the joint venture will be determined by the Department at the time of Certification.

5. Contract Goals. Goals that the Department feels should appropriately be met by the successful bidder. Contract goals will be the percentage stated in the Invitation for Bids and in the Project Specifications. Successful bidders that are awarded a contract based on sufficient reasonable efforts will be expected to make Good Faith efforts, throughout the period of time that work on the project is in process, to provide for additional MBE participation toward meeting the goals.

6. Sufficient Reasonable Efforts. To demonstrate sufficient reasonable efforts to meet contract goals, prior to Award of Contract, the Contractor shall document to the Division by use of DOH Form No. 718, MBE Sufficient Reasonable Effort Documentation (sample attached), the efforts made including, but not limited to the efforts listed on Form No. 718.

7. Good Faith Efforts. To demonstrate Good Faith efforts to meet contract goals throughout the performance of the contract, the Contractor shall document to the Division the steps taken including, but not limited to the following:

   A. Seek out and consider MBEs as potential subcontractors.
      (1) Contact two or more MBEs for each category of work that is being subcontracted.
      (2) Affirmatively solicit their interest, capability, and price quotations.
      (3) Provide equal time for all prospective subcontractors to prepare their proposals.
      (4) Provide at least as much time toMBEs in assisting them to prepare their bids for subcontract work as to non-minority contractors.
      (5) Award subcontracts to MBEs where MBE quotations are reasonably competitive with other quotations received.

   B. Maintain documentation of MBEs contacted and their responses.
      (1) Maintain a list of MBEs contacted as prospective subcontractors.
      (2) Maintain thorough documentation of criteria used to select each subcontractor.
      (3) Where an MBE expressed an interest in a subcontract and made a quotation, and where the work was not awarded to an MBE, furnish a detailed letter explaining the reasons.

(b) Certification as an MBE by the Department

1. Any contractor may apply to the Department for status as an MBE. Application shall be made on forms provided by the Department entitled "Minority Contractor Identification Statement" DOH Forms No. 892 and 894 (Schedule A) or "Information for Determining Joint Venture Eligibility" DOH Form No. 893 (Schedule B). Application need not be made in connection with a particular bid. Only work contracted to MBE contractors or subcontracted to MBEs shall be considered toward contract goals as established elsewhere in these specifications.

2. It shall be the Contractor's responsibility to submit applications so that the Department has sufficient time to render decisions. The Department will review applications in a timely manner but is not committed to approve MBE status within any given period of time. Joint venture applications should be submitted well in advance of bid openings.

3. The Department will prepare, publish or make available from time to time a list of MBE contractors, vendors and suppliers for the purpose of providing a reference source to assist any bidder in identifying MBEs. Bidders will be solely responsible for verifying the Certification, by the Department, of MBEs they intend to use, prior to submitting a proposal. The External EEO Administrator of the Division will maintain a current list of eligible MBEs.

4. In meeting the requirements of this bid condition, bidders are in no way limited to the MBE directory referred to in 3. above in seeking out and negotiating with MBE contractors and determining which items of work shall be subcontracted to MBE contractors. Bidders shall exercise their own judgments in selecting any subcontractor to perform any portion of the work.

5. Fully executed DOH Form Nos. 892, 893 and 894 shall be submitted to the Division prior to award of contract.

(c) Bidding Requirements

1. Potential contractors shall submit a fully executed DOH Form No. 714 with their proposal and a fully executed DOH Form No. 715 (sample attached) no later than five calendar days after the date of bid opening, to the External EEO Administrator in the Division's Staff Construction Branch.

2. The award of contract, if awarded, will be made to the lowest responsible bidder that will meet or exceed the contract goals or, if goals will not be met, is able to demonstrate that sufficient reasonable efforts were made to meet the goals. Sufficient reasonable efforts are explained in (a)6 of this special provision.

3. The use of an MBE firm named on a DOH Form No. 715, for the items of work described, is a condition of award. Substitutions will not be allowed. The replacement of an MBE firm that has failed to perform under a fully executed subcontract may be allowed as provided for in (e) of this special provision. Failure to comply will constitute grounds for default and termination of the contract.

(d) Counting MBE Participation Toward Goals

1. Once a firm has been certified as an MBE by the Department the total dollar amount of the contract awarded to the firm shall be counted toward the applicable contract goals as explained below.

2. The actual dollar total of a proposed subcontract, supply or service contract with an MBE firm will be reported to the Department using DOH Form No. 713. A DOH Form No. 713 for subcontracts is to be submitted with the DOH Form No. 205 and receipt will be a condition of approval. A DOH Form No. 713 for a supply or service contract is to be submitted once a contract has been fully executed so the Division will be able to report the MBE participation in a timely manner. The eligibility of a proposed MBE subcontractor will be finally established based on the firm's status at the time of DOH Form No. 205 approval. The eligibility of an MBE supplier or service firm will be finally established as of the date the DOH Form No. 713 is received by the Division. If a firm becomes certified as an MBE during performance under a fully executed contract then 100% of the work performed by the firm under that contract may be claimed as eligible work.

3. The total dollar amount of a contract awarded to a DBE shall be counted toward the DBE goal. The total dollar amount of a contract awarded to a WBE shall be counted toward the WBE goal. If an MBE is owned and controlled by both socially and economically disadvantaged individuals and women but not by either group individually, the total dollar amount of a contract awarded to it shall be divided between the goals in proportion to the percentage of ownership and control of each group in the business. The following examples will clarify the above:

Example 1. An MBE is owned by:(DBE controls)

51% DBE
49% WBE or other non-mimorities

This MBE will be certified as a DBE (100%) and the total dollar amount of a contract awarded to it must be counted toward the DBE goal.

Example 2. An MBE is owned by:(WBE controls)

51% WBE
49% DBE or other non-women

This MBE will be certified as a WBE (100%) and the total dollar amount of a contract awarded to it must be counted toward the WBE goal.

Example 3. An MBE is owned by:(Neither controls separately)

30% DBE		20% DBE
30% WBE	or	20% WBE
40% Other		20% Disadvantaged Women
		40% Other

This MBE will be certified as part DBE and part WBE based on the prorated ownership percentages. The total value of a contract awarded to the firm shall be counted according to the percentages determined by the Department at the time the firm is certified.

Example 4. An MBE is owned by: (Either DBE or WBE can control)

51% WBE { 31% DBE, 20% Disadvantaged Women } 51% DBE
31% WBE
18% Other

The total dollar amount of a contract awarded to an MBE owned and controlled by a disadvantaged woman may be assigned by any one of the following methods:

(1) 100% DBE.

(2) 100% WBE.

(3) A percentage DBE and a percentage WBE, the total of the percentages not to exceed 100%.

4. A Contractor may count toward its contract goals the percentage of the total dollar amount of a contract with a Department certified joint venture that equals the percentage of the ownership and controls of the MBE partner in a joint venture.

5. A. A Contractor may count toward its contract goals only that percentage of expenditures to MBEs that perform a commercially useful function in the work of a contract. An MBE is considered to be performing a commercially useful function by actually performing, managing, and supervising the work involved. To determine whether an MBE is performing a commercially useful function, the Division shall evaluate the amount of work subcontracted, industry practices, and other relevant factors.

   B. Consistent with normal industry practices, an MBE may enter into subcontracts. If an MBE contractor subcontracts a significantly greater portion of the work of the contract than would be expected on the basis of normal industry practices, the MBE shall be presumed not to be performing a commercially useful function. The MBE may present evidence to rebut this presumption to the Division.

6. A Contractor may count toward its contract goals the percentage of expenditures for materials and supplies obtained from MBE suppliers and manufacturers, provided that the MBEs assume the actual and contractual responsibility for the provision of the materials and supplies.

   A. The Contractor may count the percentage of the entire expenditure to an MBE manufacturer (i.e., a supplier that produces goods from raw materials or substantially alters them before resale).

   B. The Contractor may count 20 percent of its expenditures to MBE suppliers that are not manufacturers, provided that the MBE supplier performs a commercially useful function in the supply process.

7. To determine the goals achieved under this contract the MBE participation as described in (d) of this special provision shall be divided by the original prime contracted amount and multiplied by 100 to determine the percentage of performance. The Contractor shall maintain records of payment that show amounts paid to MBEs. Upon completion of the project, the Contractor shall submit a DOH Form No. 17 listing all MBEs that engaged in this contract and report the total dollar amount paid to each. The Contractor shall certify the amount paid. This certification shall include a co-signature by the MBE and may be audited by the Division. When there is no participation by MBEs the Contractor shall submit a DOH Form No. 17 that indicates no participation.

(e) MBE Subcontractors Failure to Perform Successfully

If the Contractor finds that an MBE subcontractor is unable to perform successfully under a fully executed subcontract, the Contractor shall make a Good Faith effort to replace the MBE subcontractor with another MBE. Good Faith effort is defined in (a)7 of this special provision.

1. Substitutions of MBE subcontractors must receive prior written approval by the Division. Replacements of MBEs by non-MBEs must be approved in writing by the Chief Engineer.

   Prior to the Division entertaining any requests for a replacement MBE subcontractor, the Contractor shall provide to the Division, the following information:

   A. Documentation that the subject MBE subcontractor did not perform in a satisfactory manner.

   B. Documentation of the Contractor's assistance to the MBE subcontractor prior to finding the MBE subcontractor in default.

   C. A copy of the certified letter finding the MBE to be in default.

   D. Copy of the contract between the Contractor and the MBE subcontractor, plus any modifications thereto.

   E. Documentation of the Good Faith efforts in finding a replacement MBE subcontractor and the results of the efforts.

2. The Division reserves the right to order completion of the work that was subcontracted to an MBE, who is unable to perform successfully, by either of the following methods:

   A. In the event the Contractor is able to locate a replacement MBE who can perform the work at a reasonable cost to the Contractor, modify or renegotiate the contract to compensate for reasonable extra costs, if any, to the Contractor because of a higher price in the proposal of the replacement MBE subcontractor than that of the original MBE subcontractor who failed to perform.

   B. Order the work completed by the Contractor under the terms of the original contract.

3. An MBE firm that is found to be in default by its prime Contractor for failure to perform will be sent a "Notice of Intent to Debar" and will be offered an opportunity to present any information the firm feels is sufficient to prevent debarment.

(f) Sanctions

A finding by the Division that the Contractor is failing to make Good Faith efforts to meet contract goals shall be considered sufficient reason for Default and Termination of the contract for this project in accordance with with subsection 108.08 of the Standard Specifications.

Attachments:
DOH Form No. 715
DOH Form No. 718

DEPARTMENT OF HIGHWAYS
STATE OF COLORADO
DIVISION OF HIGHWAYS
DOH Form No. 715
Rev. July, 1985

MBE Participation

Project No. _____
Location _____
Date _____
Sheet _____ of _____ Sheets

NOTE: Submit separate sheets for each proposed DBE and WBE and separate packages for DBEs and WBEs.

Acting in my capacity as officer of a bidder (bidders if a joint venture) on this contract, I request that we be allowed to remain in competition for this contract. I assure that the contract goals as established for this contract will be met or that I have attached to this form my documentation establishing that I have demonstrated sufficient reasonable efforts to meet the goals. The following work under this contract will be performed by:

NAME OF FIRM: _____

Check appropriate box or boxes

This work is to be counted toward the contract goal for: DBE ☐ Cert. No. _____ Exp. Date _____
WBE ☐ Cert. No. _____ Exp. Date _____

DBE/WBE ☐ Cert. No. _____ Exp. Date _____
DBE _____% $ _____ *
WBE _____% $ _____ *

Items of work to be subcontracted

* Note: If split, then submit this form with both DBE & WBE packages and enter the box below the appropriate part of the subcontract dollar total as indicated above.

CONFIDENTIAL

** Note: Dollar values are to be actual subcontract dollars and not prime contract prices.

** Total Dollar Value of this Proposed Subcontract Applicable toward Contract Goal _____

Total Dollar Value of Proposed Subcontracts Applicable toward Contract Goals from Prior Sheets _____

Accumulative Value of Proposed Subcontracts Applicable to Contract Goal _____

Original Contract Bid Total _____

Accumulative Percent of Contract Bid Total Subcontracted to DBEs _____

or

WBEs _____

Send to
External EEO Administrator
Rm. 287
Colorado Department of Highways
4201 East Arkansas Ave.
Denver, Colorado 80222

CERTIFICATION: My signature on this form certifies:

1. That my company has accepted a proposal from the firm named above; and
2. That my company has notified the firm named above of this commitment; and
3. That my company understands that use of the above named firm for the items of work listed is a condition of award, and
4. That my company will invite the above named firm to attend the preconstruction conference; and
5. That substitutions will not be allowed except as stipulated in the MBE Definitions and Requirements for the above named firm's failure to perform under a fully executed subcontract. In that case, I shall make good faith efforts to subcontract the work to an alternate MBE. The Department may cooperate by modifying or renegotiating the contract if it is necessary due to reasonable extra costs incurred by my company which are directly related to subcontracting the above referenced items with a replacement MBE.
6. That I understand that failure to comply will constitute grounds for termination of the contract.

I declare under penalty of perjury in the second degree, and any other applicable state or federal laws, that the statements made on this document are true and complete to the best of my knowledge.

_____
COMPANY NAME

By: _____

Title: _____

Previous editions of this form are obsolete

DEPARTMENT OF HIGHWAYS
STATE OF COLORADO
DIVISION OF HIGHWAYS
DOH Form No. 718
July, 1985

PROJECT _____

LOCATION _____

DATE _____

MBE SUFFICIENT REASONABLE EFFORT DOCUMENTATION

The Contractor who is the apparent low bidder on a CDOH construction project and has failed to meet the MBE Contract goals shall document on this form the sufficient reasonable efforts made by said Contractor to attempt to meet these goals.

Each portion of this form is to be addressed in the spaces provided. Attach support documentation if necessary. Use attached sheet to supplement space provided. This completed form is to be submitted to the CDOH Staff Construction Branch prior to 4:30 PM on the fifth calendar day after the day bids are opened.

I. Efforts made to assist the MBEs contacted that needed assistance in obtaining bonding and/or insurance required by the Contractor or the Department:

II. Efforts made to solicit bids from MBEs on particular items in order to increase the likelihood of achieving the stated goals:

III. Whether the Contract provided written notice to a reasonable number of specific MBEs that their interest in the contract was being solicited, in sufficient time to allow the MBEs to participate effectively.

IV. Efforts to negotiate with MBEs for specific bids including a minimum of:
a. Names, addresses, and telephone numbers of MBEs contacted.
b. Description of the information provided to MBEs regarding plans and specifications for the items for which bids were solicited.
c. Statement of why additional agreements with MBEs were not reached.

-OVER-

V. Information concerning any MBE contacts that were rejected as unqualified and the reasons for this rejection:

VI. Whether the Contractor advertised in general circulation, trade association and minority-focus media concerning the subcontracting opportunities. These advertisements must be project specific and state the type of work for which proposals are being invited.

VII. Information on attendance and participation by the Contractor and MBEs at any pre-bid meeting to inform MBEs of subcontracting opportunities:

VIII. List selected portions of the work intended to be performed by MBEs in order to increase the likelihood of meeting the MBE goals (including, where appropriate) breaking down contracts into economically feasible units to facilitate MBE participation:

IX. Information on the use of minority community organizations, minority contractor groups, the Colorado Minority Business Development Agency, and other organizations that provide assistance in the recruitment and placement of MBEs.

X. Other factors or types of effort concerning MBE contract participation felt to be relevant:

_____
COMPANY

By _____

Title _____

(July 24, 1978)

CONSTRUCTION SAFETY AND HEALTH STANDARDS

It is a condition of this contract, and shall be made a condition of each subcontract entered into pursuant to this contract, that the Contractor and any subcontractor shall not require any laborer or mechanic employed in performance of the contract to work in surroundings or under working conditions which are unsanitary, hazardous, or dangerous to his health or safety, as determined under construction safety and health standards (Rules and Regulations of the Federal Occupational Safety and Health Act of 1970 (OSHA) and as amended).

(November 8, 1985)

Form FHWA-47: STATEMENT OF MATERIALS AND LABOR USED BY CONTRACTORS ON HIGHWAY CONSTRUCTION INVOLVING FEDERAL FUNDS

Form FHWA-47 shall be submitted to the Engineer for each Federal-Aid Primary, Urban, and Interstate System Project involving construction performed under contract awarded by competitive bidding, except for the following cases:

(1) Projects for which the total final construction costs for roadway are less than $500,000.
(2) Projects consisting primarily of the installation of protective devices at railroad grade crossings.
(3) Projects consisting primarily of highway beautification.

The report will include data for all subcontractors, which may be combined by the prime Contractor into one report.

Forms are available from the Resident Engineer. Preparation instructions on the back of the form should be followed.

(November 8, 1985)

EXEMPTION FROM TON-MILE TAXES

Publicly owned vehicles and Contractor's vehicles operating within the confines of the project are exempted from the payment of ton-mile taxes under Section 42-3-127, CRS. The confines of the project as exempted under Section 42-3-127, CRS are defined as including all sources of earthen or mineral aggregates and water for use on the project, and the connecting roads or areas between the project and such sources.

ON-THE-JOB TRAINING

This Training Special Provision supplements subparagraph 6 of the Special Provision entitled "Affirmative Action Requirements, Equal Employment Opportunity" and is in implementation of 23 U.S.C. 140(a).

As part of the Contractor's equal employment opportunity affirmative action program training shall be provided as follows:

The Contractor shall provide on-the-job training aimed at developing full journeymen in the type of trade or job classification involved.

The number of trainees to be trained shall be as shown in the plans and special provisions for the project.

In the event a Contractor subcontracts a portion of the contract work, he shall determine how many, if any, of the trainees are to be trained by the subcontractor, provided, however, that the Contractor shall retain the primary responsibility for meeting the training requirements imposed by this special provision. The Contractor shall also insure that this training special provision is made applicable to such subcontract. Where feasible, 25 percent of apprentices or trainees in each occupation shall be in their first year of apprenticeship or training.

The number of trainees shall be distributed among the work classifications on the basis of the Contractor's needs and the availability of journeymen in the various classifications within a reasonable area of recruitment. Prior to commencing construction, the Contractor shall submit the number of trainees to be trained in each selected classification and training program to be used to the Division of Highways for approval. Furthermore, the Contractor shall specify the starting time for training in each of the classifications. The Contractor will be credited for each trainee employed by him on the contract work who is currently enrolled or becomes enrolled in an approved program and will be reimbursed for such trainees as provided hereinafter.

Training and upgrading of minorities and women toward journeyman status is a primary objective of this Training Special Provision. Accordingly, the Contractor shall make every effort to enroll minority trainees and women (e.g., by conducting systematic and direct recruitment through public and private sources likely to yield minority and women trainees) to the extent that such persons are available within a reasonable area of recruitment. The Contractor shall be responsible for demonstrating the steps that he has taken in pursuance thereof, prior to a determination as to whether the Contractor is in compliance with this Training Special Provision. This training commitment is not intended, and shall not be used, to discriminate against any applicant for training, whether a member of a minority group or not.

An employee shall not be employed as a trainee in any classification in which he has successfully completed a training course leading to journeyman status or in which he has been employed as a journeyman. The Contractor shall satisfy this requirement by including appropriate questions in the employee application or by other suitable means. Regardless of the method used, the Contractor's records shall document the findings in each case.

The minimum length and type of training for each classification shall be as established in the training program selected by the Contractor and approved by the Division of Highways and the Federal Highway Administration. The Division of Highways and the Federal Highway Administration will approve a program if it is reasonably calculated to meet the equal employment opportunity obligations of the Contractor and to qualify the average trainee for journeyman status in the classification concerned by the end of the training period. Furthermore, apprenticeship programs registered with the U.S. Department of Labor, Bureau of Apprenticeship and Training, or with a State apprenticeship agency recognized by the Bureau and training programs approved but not necessarily sponsored by the U.S. Department of Labor, Manpower Administration, Bureau of Apprenticeship and Training will also be considered acceptable provided they are being administered in a manner consistent with the equal employment obligations of Federal-Aid highway construction contracts. Approval or acceptance of a training program shall be obtained from the State prior to commencing work on the classification covered by the program. It is the intention of these provisions that training is to be provided in the construction crafts rather than clerk-typists or secretarial-type positions. Training is permissible in lower level management positions such as office engineers, estimators, time-keepers, etc., where the training is oriented toward construction applications. Training in the laborer classification may be permitted when significant and meaningful training is provided and approved by the FHWA Division office. Some offsite training is permissible as long as the training is an integral part of an approved training program and does not comprise a significant part of the overall training.

-continued-

Except as otherwise noted below, the Contractor will be reimbursed 80 cents per hour of training given an employee on this contract in accordance with an approved training program. When approved by the Engineer, reimbursement will be made for training persons in excess of the number specified herein. This reimbursement will be made even though the Contractor receives additional training program funds from other sources, provided such other source does not specifically prohibit the Contractor from receiving other reimbursement. Reimbursement for offsite training indicated above may only be made to the Contractor where he does one or more of the following and the trainees are concurrently employed on a Federal-Aid project; contributes to the cost of the training, provides the instruction to the trainee or pays the trainee's wages during the offsite training period.

Payment will not be made to the Contractor if either the failure to provide the required training, or the failure to hire the trainee as a journeyman, is caused by the Contractor and the Contractor evidences a lack of good faith in meeting the requirements of this Training Special Provision. It is normally expected that a trainee will begin his training on the project as soon as feasible after start of work utilizing the skill involved and remain on the project as long as training opportunities exist in his work classification or until he has completed his training program. It is not required that all trainees be on board for the entire length of the contract. A Contractor shall have fulfilled his responsibilities under this Training Special Provision if he has provided acceptable training to the number of trainees specified. The number trained will be determined on the basis of the total number enrolled on the contract for a significant period.

Trainees shall be paid at least 60 percent of the appropriate minimum journeyman's rate being paid by the contractor for the first half of the training period, 75 percent for the third quarter of the training period, and 90 percent for the last quarter of the training period, unless apprentices or trainees in an approved existing program are enrolled as trainees on this project. In that case, the appropriate rates approved by the Departments of Labor or Transportation in connection with the existing program will apply to all trainees being trained for the same classification who are covered by this Training Special Provision.

The Contractor shall furnish the trainee a copy of the program he will follow in providing the training. The Contractor shall provide each trainee with a certification showing the type and length of training satisfactorily completed.

The Contractor shall provide for the maintenance of records and furnish periodic reports documenting his performance under this Training Special Provision.

All forms referred to are available in the Staff Construction Office of the Division of Highways, or through the Resident Engineer.

October 22, 1982

RAILROAD INSURANCE

The Contractor on this project will be required to carry insurance of the following kinds and amounts:

A. CONTRACTOR'S PUBLIC LIABILITY AND PROPERTY DAMAGE LIABILITY INSURANCE.

The Contractor shall furnish evidence to the Division that with respect to the operations he performs, he carries Contractor's Public Liability Insurance providing for a limit of not less than One Million Dollars (1,000,000.00) for all damages arising out of bodily injuries to or death of one person and subject to that limit for each person, a total limit of Two Million Dollars ($2,000,000.00) for all damages arising out of bodily injuries to or death of two or more persons in any one occurrence; and Contractor's Property Damage Liability Insurance providing for a limit of not less than One Million Dollars ($1,000,000.00) for all damages arising out of injury to or destruction of property in any one occurrence and subject to that limit per occurrence, a total (or aggregate) limit of Two Million Dollars ($2,000,000.00) for all damages arising out of injury to or destruction of property during the policy period.

If any part of the work affecting railroad property or facilities is sublet, similar insurance shall be provided by or in behalf of the Subcontractor(s) involved.

B. CONTRACTOR'S PROTECTIVE PUBLIC LIABILITY AND PROPERTY DAMAGE LIABILITY INSURANCE.

The Contractor shall furnish evidence to the Division that with respect to the operations performed for him by Subcontractors, he carries in his own behalf Contractor's Protective Public Liability Insurance providing for a limit of not less than One Million Dollars ($1,000,000.00) for all damages arising out of bodily injuries to or death of one person and subject to that limit for each person a total limit of Two Million Dollars ($2,000,000.00) for all damages arising out of bodily injuries to or death of two or more persons in any one occurrence; and Contractor's Protective Property Damage Liability Insurance providing for a limit of not less than One Million Dollars ($1,000,000.00) for all damages arising out of injury to or destruction of property in any one occurrence, and subject to that limit per occurrence, a total (or aggregate) limit of Two Million Dollars ($2,000,000.00) for all damages arising out of injury to or destruction of property during the policy period.

C. RAILROAD'S PROTECTIVE LIABILITY AND PROPERTY DAMAGE INSURANCE.

In addition to the above, the Contractor shall furnish evidence to the Division that, with respect to the operations he or any of his Subcontractors perform, he has provided for and in behalf of the Railroad Company, and each Railroad Company when more than one is involved, Railroad Protective Public Liability and Property Damage Insurance providing for a combined single limit of Two Million Dollars ($2,000,000.00) per occurrence with an aggregate limit of Six Million Dollars ($6,000,000.00) applying separately for each annual period for:

1. All damages arising out of bodily injuries to or death of one or more persons.

2. All damages arising out of injury to or destruction of property.

D. GENERAL.

Said policy or policies of insurance shall be deemed to comply with the requirements of this Special Provision if each of said policies contains properly completed and executed "Railroad Protective Liability Form", reference copies of which are available from the Staff Construction Engineer of the Division of Highways, State of Colorado, 4201 East Arkansas Avenue, Denver, Colorado 80222.

Certificates of insurance required under A. and B. above, and policy or policies of Insurance required under C. above shall be furnished to the Division's Staff Construction Engineer for transmittal to the Railroad Company's Insurance Department.

The insurance hereinbefore specified shall be carried until all work required to be performed under the terms of the contract is satisfactorily completed as evidenced by the formal acceptance of the Division. The Railroad Company shall be furnished with the original of each policy carried in its behalf.

April 20, 1983

SPECIAL NOTICE TO CONTRACTORS

To insure the proper inspection, sampling, and certification of materials required for DOH construction projects, the following is required of the contractor:

1. DOCUMENTATION ON REINFORCING STEEL

   (A) One copy of the invoice or shipping ticket accompanying each shipment of reinforcing steel delivered to the project will be provided to the DOH Project Engineer at the job site.

   (B) All reinforcing steel shipped to the project must come from the source as designated in 2. (A) below.

2. INFORM DIVISION OF HIGHWAYS OF MATERIALS SOURCES

   (A) In compliance with Subsection 106.01 of the Standard Specification, promptly submit a letter listing the source of all materials to be used at least two weeks prior to delivery.

   (B) Include name and address of each supplier, where the material may be inspected, and specific name of the item ordered.

   (C) Address the letter to the Resident Engineer and send two copies to the Staff Construction Engineer, Colorado Division of Highways, 4201 E. Arkansas Ave., Denver, Colorado 80222.

3. INFORM SUPPLIERS OF MATERIALS SAMPLING AND TESTING REQUIREMENTS

   When ordering materials follow the appropriate procedure outlined below.

   (A) **For Preinspected or Pretested Items:**

   Concrete, precast prestressed
   Concrete, curing compounds
   Joint fillers, preformed
   Joint sealer, bridge compression
   Paints
   Pipe, corrugated steel manufactured or stored (in state)
   Pipe, precast concrete
   Pipe, siphon
   Pipe, welded steel, coated
   Pipe, Corrugated Aluminum
   Reflectors, delineator
   Steel, structural
   Steel, structural, galvanized
   Sign structures
   Sign posts, WF steel
   Sign posts, timber
   Reinforcing steel
   Timber, treated
   Traffic paint and glass beads
   Reinforcing Steel (epoxy coated)
   Guard Rail, Posts, Treated Timber

   Write on the Purchase Order, "To be inspected or Pretested by the Materials Branch of the Colorado Division of Highways before shipment. Please arrange for inspection before fabrication or pretesting before shipment by calling the Materials Branch, Denver, Colorado, 303-757-9226 or write to the Materials Branch, CDOH, 4340 East Louisiana Avenue, Denver, Colorado, 80222.

   (B) **For Items Cleared by Certified Mill Test Results:**

   Bearing pads, elastomeric
   Cribbing, metal
   Gabion wire baskets
   Guard Rail, metal plate & posts (steel)
   Piling, steel sheet
   Piling, steel pipe
   Piling, steel shape
   Pipe, structural plate
   Pipe, steel (out-of-state)

continued

Write on the purchase order, "Supply us (the contractor) with three copies of certified mill test reports before shipment. Include test results showing compliance with appropriate specifications for the separately identified heat numbers or lot numbers. Submit the reports with a letter of transmittal in triplicate which lists the project number and location, item name, size, class, quantity, and the Colorado Division of Highways specification number which it meets." Upon receipt of these test reports and their letter of transmittal, promptly deliver them to the CDOH Project Engineer (retaining one copy of the letter of transmittal for your records) so that he may verify heat or lot numbers with those found on the items before the material is used.

(C) **For Items Cleared by Certificate of Compliance:**

Bridge expansion device, pre-molded
Concrete items (precast, but not prestressed)
Fertilizer, commercial
Insulation, interior
Mulching, wood cellulose
Pipe, cast iron
Manholerings and covers (cast iron)
Inlet grates and frames (cast iron)
Pipe, clay
Pipe, copper
Seed and sod
Sprinkler systems
Tile, ceramic & glazed
Water control devices
Guard Rail, Type 4, Precast
Bridge Bearing Device
Sign Panels
Epoxy coating for reinforcing steel

Write on the purchase order, "Supply us (the contractor) with four copies of a Certificate of Compliance stating that the material you are supplying fully complies with the appropriate Colorado Division of Highways Specification. On the Certificate, list the project number and location, the item name, size, class, quantity, and the DOH Specification which it is to meet." Upon receipt of these Certificates, promptly deliver three copies to the DOH Project Engineer and retain one copy for your records.

(D) **For All Other Manufactured and Commercially Supplied Items:**

Asphalt Material
Cement, Portland
Concrete admixtures
Concrete air entraining agents
Fencing materials, all metal
Joint fillers, poured
Pipe, standard galvanized
Plants
Posts, delineator
Posts, U2 or Unistrut
Rope, wire
Sheeting, copper
Sheeting, plastic
Timber, untreated
Sterilizers, soil
Waterproofing materials
Valves and fittings
Welded Wire Fabric
All rest area items not covered under A, B, or C, above.

Write on the purchase order, "Materials to meet the current specifications and sampling or certification procedures of the Colorado Division of Highways." (See DOH Schedule for Minimum Materials Sampling, Testing, and Inspection.)

4. TRANSMIT THIS INFORMATION TO YOUR SUBCONTRACTORS:

Failure to provide for preapproval of materials may result in delays to the project while these clearances are being obtained. Copies of the DOH Minimum Materials Sampling, Testing, and Inspection Schedule are available from the DOH Materials Branch, 4340 East Louisiana Ave., Denver, Colorado, 80222.

STATE DEPARTMENT OF HIGHWAYS
DIVISION OF HIGHWAYS
STATE OF COLORADO

SUPPLEMENTAL SPECIFICATIONS TO THE 1981 STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION

Effective October 1, 1984 the Standard Specifications shall be amended and expanded with the revisions, deletions and additions contained herein.

October 1, 1984

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COLORADO DIVISION OF HIGHWAYS
SUPPLEMENTAL SPECIFICATIONS

SECTION 105
CONTROL OF WORK

Subsection 105.02 shall be revised as follows:

Delete the seventh paragraph.

Delete the first sentence of the eighth paragraph and replace with the following:

Six sets of shop drawings shall be submitted to the Engineer.

Delete the eleventh paragraph and replace with the following:

The time required for approval of each submittal will not exceed four weeks after shop drawings are received by the Engineer.

SECTION 108
PROSECUTION AND PROGRESS

Delete subsection 108.03 and replace with the following:

108.03 Progress Schedule. The Contractor shall submit a Progress Schedule within 10 working days of the date construction is authorized to proceed. Salient features to be considered are listed in the special provisions. A revised Progress Schedule, as deemed necessary for substantial changes, shall be submitted within 10 working days of the Engineer's written request. The Engineer will not authorize any payment for items until the required initial or requested revised Progress Schedules have been received.

The Contractor may furnish the Progress Schedule on forms of his choice or on forms supplied by the Engineer. The Progress Schedule shall consist of two components; one a Comprehensive Bar Chart and the other a Methods Statement, each on a separate report.

(a) The Comprehensive Bar Chart shall show, as a minimum, the following:
1. The salient features, as listed in the special provisions, into which the project may be divided in planning construction, listed in the order in which the Contractor proposes to carry out the work.
2. Any salient feature not listed in the special provisions that the Contractor considers a controlling factor for timely completion.
3. The time span of activities for each salient feature, and its relationship in time to other salient features.
4. The total anticipated time necessary to complete all work required under the contract.
5. Sufficient space for each salient feature to permit two additional plots parallel to the original time span plot, one for a revision of the planned time span, and one showing actual time spans achieved.

(b) The Methods Statement shall be a narrative description of the activities displayed in the Comprehensive Bar Chart. It shall contain details as follows:
1. A description of the work or activities to be done within each salient feature; methods to be employed, including the time frame within which each salient feature is to be completed.
2. A description of major activities within each salient feature, related to the location on the project where these activities will occur.
3. An estimate of the months, or period within any month, during which a salient feature is inactive or partially inactive. This estimate shall show the beginning and ending dates of the reduced production or inactivity.
4. The anticipated and critical delivery dates for equipment or materials in any salient feature that can affect timely completion of the project.
5. Critical completion dates for any activity within any salient feature to maintain the progress indicated in the Progress Schedule.

All information on the Methods Statement is proprietary and shall be kept confidential.

The Contractor shall provide the Engineer within two weeks after the Contractor's specified estimate day, a copy of the Progress Schedule showing the status of work actually completed to that date. The Engineer may provide copies of the Contractor's actual progress schedule to other affected Contractors working within the project's area of influence as requested and deemed appropriate.

Should the prosecution of the work for any reason be discontinued, the Contractor shall notify the Engineer at least 24 hours in advance of resuming operations.

Meetings may be required to review progress and plan upcoming activities. The meetings will be held when requested by the Engineer or the Contractor. Sufficient notice shall be given to each party in advance of the meeting time and location. Problem areas are to be discussed, such as substantial deviations from the Project Schedule. When the project is behind schedule, methods for returning to the planned schedule will be discussed.

Payment for Progress schedule preparation or revision will not be paid for separately but shall be included in the work.

SECTION 212
SEEDING, FERTILIZER AND SODDING

In subsection 212.06(c), delete the first sentence and replace with the following:

All slopes 3:1 and flatter shall be seeded by mechanical power drawn drills followed by packer wheels or drag chains.

SECTION 401
PLANT MIX PAVEMENTS-GENERAL

In subsection 401.06, second paragraph, delete the last sentence.

SECTION 412
PORTLAND CEMENT CONCRETE PAVEMENT

In subsection 412.15(a), delete the second paragraph and replace with the following:

If the surface of the pavement becomes dry immediately following finishing operations, due to an excessive evaporation rate, it shall be covered with wet burlap or fogged with water covering the entire pavement surface using pneumatic atomizing nozzles. The fog spray shall be just enough to retard surface evaporation and shall not change the water-cement ratio. During periods of excessive drying, a cover of wet burlap or plastic sheeting shall be maintained on the pavement surface at all times until final cure cover is placed. Monomolecular film coatings applied to the surface of the slab to retain moisture may be used provided they effectively retard surface evaporation and are adequately maintained throughout the finishing operation.

SECTION 510
STRUCTURAL PLATE STRUCTURES

In subsection 510.03, second paragraph, delete the first sentence.

SECTION 601
STRUCTURAL CONCRETE

In subsection 601.05(a), delete the fourth paragraph.

In subsection 601.07(c)3, add the following to the last paragraph:

Water shall be measured to the accuracy prescribed in AASHTO M 157.

In subsection 601.13(b), delete the second paragraph and replace with the following:

An approved Type 1-D, Class B with fugitive dye or Type 2, Class B curing compound may be used on concrete surfaces where curing compound is allowed, except that Type 2 shall not be used on exposed aggregate concrete or colored concrete or when directed. Curing compound shall not be used on construction joints.

Delete subsection 601.15(c) and replace with the following:

(c) *Finishing.* Following consolidation, the concrete shall be struck off and finished by mechanical longitudinal floating, mechanical rolling, surface vibration, or a combination of any of these methods. Surface vibrators shall be of the low-frequency, high-amplitude type, operating at a speed of 3000 to 4500 rpm. If the vibrator speed is adjustable, maximum speed shall be used on the first pass and minimum of subsequent coverage.

The Contractor shall state at the pre-construction conference the make and type of deck finishing machine he intends to use, and shall obtain written approval from the Engineer prior to the machine's use.

A paver's steel scraping straightedge or lute (4" maximum width) will be the only hand tool permitted on deck surfaces, except for a minimum use of metal hand floats and edgers along the forms and in areas where machine finishing cannot be effectively used. Only minimum hand finishing will be permitted and when the Engineer deems the slab surface is being overworked all hand finishing will be stopped. If the surface of the deck slab becomes dry immediately following finishing operations, due to an excessive evaporation rate, it shall be covered with wet burlap or fogged with water covering the entire deck surface using pneumatic atomizing nozzels. The fog spray shall be just enough to retard surface evaporation and shall not change the water-cement ratio. During periods of excessive drying, a cover of wet burlap or plastic sheeting will be maintained on the slab at all times until final cure cover is placed. Monomolecular film coatings applied to the surface of the slab to retain moisture may be used provided they effectively retard surface evaporation and are adequately maintained throughout the finishing operation.

Bridge decks that will not be covered with waterproofing membrane shall receive a final finish conforming to the requirements of subsection 412.15(f).

Delete subsection 601.16(b)2 and replace with the following:

2. *Membrane Forming Curing Compound Method.* An approved Type 1-D, Class B with fugitive dye or Type 2, Class B curing compound may be used on bridge decks including bridge curbs and sidewalks and applied in conformance with subsection 601.16(a)1. The areas where curbs and sidewalks will subsequently be placed shall be cured in accordance with subparagraph 2 or 3 of subsection 601.16(a).

SECTION 602
REINFORCING STEEL

Delete subsection 602.02 and replace with the following:

602.02 Reinforcing steel and welded wire fabric that will be furnished either uncoated or epoxy coated shall meet the requirements of subsection 709.01. Epoxy coated reinforcing bars shall meet the requirements of AASHTO M 284. The coating material shall be a light colored powdered epoxy resin which will highlight rusting of untreated bar areas.

Subsection 602.06 shall include the following as a new last paragraph:

Epoxy coated bars shall be placed on plastic supports or steel supports fully coated with plastic or epoxy. Care shall be taken to prevent coated bars from coming into contact with other steel items.

Subsection 602.07 shall include the following as a new fourth paragraph:

The computed weight of epoxy coated reinforcing bars will be based on the nominal weight before application of the epoxy coating.

Subsection 602.08 shall include the following:

Pay Item	Pay Unit
Reinforcing Steel (Epoxy Coated)	Pound

SECTION 606
GUARD RAIL

In subsection 606.02, delete the last paragraph and replace with the following:

Components on which the spelter coating has been burned by welding or otherwise damaged shall be either regalvanized, recoated in accordance with AASHTO M36, or painted with one full brush coat of zinc rich paint meeting Military Specification MIL-P-21035.

In subsection 606.03, add the following:

(c) *Temporary End Treatment.* In construction zones not closed to traffic, installation of rail element shall closely follow the setting of posts to keep the number of posts without rail at a minimum. In order to minimize potential hazards, the Engineer may specify the direction in which the rail installation is to advance and the number of posts installed ahead of rail installation. At the end of the Contractor's work day, ends of installed guard rail shall be treated as follows:

(1) If the end is at the location of a planned end section, install the end section.
(2) If the end is not at the location of a planned end section, the last rail section shall be installed with one end attached to the rail already in place and the free end resting on the ground. The free end on the ground shall be restrained by tying the rail to the posts by ropes or cables.

In subsection 606.04, add the following:

In construction zones not closed to traffic, the contractor shall treat the ends of installed concrete guard rail as follows at the end of the work day:

(1) If the end is at the location of a planned end section, install the end section.
(2) If the end is not at the location of a planned end section, install a 12 ft. precast-portable transition section conforming to plan details and marked in accordance with subsection 614.18.

In subsection 606.06, add the following:

All work and materials necessary and incidental to the temporary treatment of guard rail ends will not be measured and paid for separately but shall be included in the work.

Partial payments will not be made for partially completed guard rail runs that do not conform to the end treatments specified in subsections 606.03(c) or 606.04.

SECTION 613
LIGHTING

In subsection 613.05, first paragraph, delete the first sentence and replace with the following:

A light standard shall consist of a metal light pole, bracket arm or arms, transformer base or approved breakaway device, and connector bolts.

In subsection 613.10, second paragraph, delete the first sentence and replace with the following:

Light standards including pole, mast arm or arms, tranformer base or approved breakaway device, and connector bolts will be measured by the number of light standards installed.

SECTION 701
HYDRAULIC CEMENT

In subsection 701.02, first paragraph, delete the third sentence.

SECTION 702
BITUMINOUS MATERIALS

Delete subsection 702.05.

SECTION 707
METAL PIPE

In subsection 707.02 delete the paragraph titled Coupling Bands and parts (a), (b), (c) and the table and sentence which follow that paragraph. Replace the deleted protion with the following.

Coupling bands shall conform to the requirements of AASHTO M 36 with the following exceptions:

(1) The use of channel type bands as described in subsection 21.2 of AASHTO M 36 will only be allowed on round pipe having a diameter of 30 inches or less.
(2) An annular type band with a minimum width of 4 inches which engages only the first corrugation of recorrugated helical pipe ends will be allowed on round pipes having flanged ends and a diameter of 30 inches or less. The bands and connecting hardware shall conform to subsection 21.1 of AASHTO M 36.

SECTION 710
FENCE AND GUARD RAIL

In subsection 710.07 add the following to the last paragraph:

Pipe material for fence posts shall conform to the requirements shown on the plans and to the requirements of Class 1 Pipe, Grade A or Grade B, of Federal Specification RR-F-191/3C.

In subsection 710.09, delete the third paragraph and replace with the following:

Bolts, nuts, and washers shall be galvanized in accordance with AASHTO M232, Class C, or AASHTO M 276, Class 50. All other fittings shall be galvanized in accordance with AASHTO M 111.

SECTION 713
TRAFFIC CONTROL MATERIALS

Subsection 713.11 shall be revised as follows:

In the second paragraph, delete the last sentence and replace with the following:

Conductors and cables shall be copper and conform to Specification 19-1 of the IMSA.

Delete the third paragraph and replace with the following:

Direct burial cable shall be copper and conform to Specification 19-5 of the IMSA except that conductors shall be seven wire, stranded.

Delete the sixth paragraph and replace with the following:

Grounding and bonding wires, straps and electrodes shall be copper and conform to NEC Article 250.

Delete subsection 713.12 and replace with the following:

713.12 Thermoplastic Marking Material. Thermoplastic marking material shall conform to AASHTO M 249 except for the following:

(a) In paragraph 3.1 of the AASHTO specifications, delete the first two sentences and replace with the following:

The material manufacturer shall have the option of formulating the material according to his own specifications. However, the binder shall be composed of alkyd resins wherein a minimum of 70% (by weight) of the binder shall be maleic modified glycerol ester of rosin. The physical and chemical properties contained in this specification shall apply regardless of the type of formulation used.

(b) In paragraph 4.3 of the AASHTO specifications, add the following physical characteristics:

The infra-red spectra of the extracted binder will be compared to the characteristic absorption bands of maleic modified glycerol ester of rosin.

(c) In paragraph 6.1 of the AASHTO specifications, delete the second sentence and replace with the following:

The containers of thermoplastic material shall weigh approximately 50 pounds (23 kg).

SECTION 715
LIGHTING MATERIALS

In subsection 715.05 delete the first sentence and replace with the following:

Ballasts shall be of the magnetic regulator type specifically manufactured for use with high pressure sodium lamps, and shall operate at a minimum of 90% power factor.

Delete subsections 715.07 and 715.08 and replace with the following:

715.07 Direct Burial Cable. Direct-burial cables shall consist of 3 conductors, 7 strand, of No. 6 AWG copper with concentric Class B stranding.

The copper wire cable shall have 2 conductors insulated with 60 mils of cross linked polyethylene. The insulation of the conductors shall be colors other than white or green with one conductor color coded to distinguish it from the other. The third conductor shall be stranded bare or tinned stranded bare.

Compact stranding will not be permitted. A separator shall be applied on conductors to provide free stripping. The void areas between conductors may or may not be filled with a non-hygroscopic material. Cables shall be bound with binding tape. The bound conductors shall be covered with interlocked galvanized (inside and outside) steel tape armor and covered with 50 mils of polyvinyl chloride (PVC). The completed cable shall be marked "Type USE or RHH or RHW". The outside diameter of the completed cable shall not be more than 1.10 inches.

When crossing under roadway, all conductors, regardless of type, shall be run in rigid metal conduit.

715.08 Lighting Circuitry and Wiring. Lighting systems shall be photoelectrically controlled. Photo cells shall be of the hermetically sealed, cadmium sulfide type and shall be preaged. Photoelectric units shall have a turn-on setting of 2.0 foot-candles, maximum. The ratio of the turn-off to turn-on setting shall be 3:1, maximum.

All electrical apparatus used in the lighting system shall be of ratings adequate to handle the necessary loads and shall conform to power source requirements.

Unless otherwise shown on the plans, copper wires and copper conductors shall be utilized for installation and shall meet the minimum specifications and sizes as required by the National Electrical Code.