CDOT PROJECT No.: MTF M555-035
CONSTRUCTION PROJECT CODE: 24077

October 27, 2022

COLORADO
DEPARTMENT OF TRANSPORTATION
24 Road Multi-modal Path Construction
SPECIAL PROVISIONS

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PROJECT SPECIAL PROVISIONS

The 2022 Standard Specifications for Road and Bridge Construction controls construction of this project. The following special provisions supplement or modify the Standard Specifications and take precedence over the Standard Specifications and plans

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NOTICE TO BIDDERS

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

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

Senior Buyer/Purchaser -		Dolly Daniels
	Office Phone:	(970) 256-4048
	Email:	dollyd@gjcity.org

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

A mandatory pre bid conference will be held on ♠ beginning at ♠ at ♠. Bids will be accepted only from pre-qualified bidders who attend the mandatory pre-bid conference.

Questions received from bidders along with CDOT responses will be posted on the City web site listed below as they become available.

http://www.gjcity.org/bids.aspx

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

The Senior Buyer, Engineering Manager, or Project Engineer will determine whether questions are innovative or proprietary in nature. If the Project Engineer determines that a question does not warrant confidentiality, the bidder may withdraw the question. If the bidder withdraws the question, the Project Engineer will not answer the question and the question will not be documented on the City web site. If the bidder does not withdraw the question, the question will be answered, and both the question and answer will be posted on the City web site. If the Project Engineer agrees that a question warrants confidentiality, the Project Engineer will answer the question, and keep both question and answer confidential. The City will keep a record of both question and answer in their confidential file.

All questions shall be directed to the City contacts listed above no later than the time and date noted in the Bid Calendar of the Solicitation. Final questions and answers will be posted no later than the time and date noted in the Bid Calendar of the Solicitation.

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

COMMENCEMENT AND COMPLETION OF WORK
(WORKING OR CALENDAR DAY)

The Contractor shall commence work under the Contract on or before the 15th day following Contract execution or the 30th day following the date of award, whichever comes later, 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 110 calendar days in accordance with the "Notice to Proceed."

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REVISION OF SECTION 102
PROJECT PLANS AND OTHER DATA

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

Subsection 102.05 shall include the following:

Plans, Specifications and other Bid Documents are available for review or download on the Public Works and Planning/Engineering page at www.gjcity.org.

Complete sets of *Bid Documents* shall be used in preparing Bids; neither City nor Engineer assumes any responsibility for errors or misinterpretations resulting from the use of incomplete sets of *Bid Documents*.

City and Engineer in making copies of *Bid Documents* available on the above terms do so only for the purpose of obtaining Bids on the Work and do not confer a license or grant for any other use.

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REVISION OF SECTION 108
PROSECUTION AND PROGRESS

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

Subsection 108.05 shall include the following:

The Contractor shall abide by the City of Grand Junction working hour limitations, 7 A.M. to 5 P.M., daily. Sunday and holiday work is not allowed. Saturday work may be allowed with prior approval of the Engineer and the City.

Lane closures are allowed only between the hours of 9:30 A.M. and 3:00 P.M. on any day of work and must have an approved Traffic Control Plan from the City of Grand Junction and Colorado Department of Transportation.

The Contractor shall indicate the project construction sequence on their schedule. As the project develops, the Contractor may request approval to use a different sequence. This request shall be submitted to the Engineer for review in writing at least seven days prior to beginning construction.

REVISION OF SECTION 203
EMBANKMENT MATERIAL

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

Subsection 203.03, first paragraph, shall include the following:

Embankment material shall meet the following requirements for Atterberg limits and gradation:

(1) Maximum liquid limit of 40
(2) Maximum plasticity index of 10
(3) A maximum of 35 percentage of material by dry weight passing the No. 200 sieve.

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

Section 240 is hereby added to the Standard Specifications for this project as follows:

DESCRIPTION

240.01 This work consists of protecting migratory birds during construction.

MATERIALS AND CONSTRUCTION REQUIREMENTS

240.02 The Contractor shall schedule clearing and grubbing operations and work on structures to avoid taking (pursue, hunt, take, capture or kill; attempt to take, capture, kill or possess) migratory birds protected by the Migratory Bird Treaty Act (MBTA). The Contractor shall retain a qualified wildlife biologist for this project. The wildlife biologist shall have a minimum of three years of experience conducting migratory bird surveys and implementing the requirements of the MBTA. The Contractor shall submit documentation of the biologist's education and experience to the Engineer for acceptance. A biologist with less experience may be used by the Contractor subject to the approval of the Engineer based on review of the biologist's qualifications.

The wildlife biologist shall record the location of each protected nest, bird species, the protection method used, and the date installed. A copy of these records shall be submitted to the Engineer.

(a) *Vegetation Removal.* When possible, vegetation shall be cleared prior to the time when active nests are present. Vegetation removal activities shall be timed to avoid the migratory bird breeding season which begins on April 1 and runs to August 31. All areas scheduled for clearing and grubbing between April 1 and August 31 shall first be surveyed within the work limits for active migratory bird nests. The Contractor's wildlife biologist shall also survey for active migratory bird nests within 50 feet outside work limits. Contractor personnel shall enter areas outside CDOT right of way only if a written, signed document granting permission to enter the property has been obtained from the property owner. The Contractor shall document all denials of permission to enter property. The Contractor shall avoid all active migratory bird nests. The Contractor shall avoid the area within 50 feet of the active nests or the area within the distance recommended by the biologist until all nests within that area have become inactive. Inactive nest removal and other necessary measures shall be incorporated into the work as follows:

1. *Tree and Shrub Removal or Trimming.* Tree and shrub removal or trimming shall occur before April 1 or after August 31 if possible. If tree and shrub removal or trimming will occur between April 1 and August 31, a survey for active nests shall be conducted by the wildlife biologist within the seven days immediately prior to the beginning of work in each area of tree and shrub removal or trimming. The survey shall be conducted for each phase of tree and shrub removal or trimming.

   If an active nest containing eggs or young birds is found, the tree or shrub containing the active nest shall remain undisturbed and protected until the nest becomes inactive. The nest shall be protected by placing fence (plastic) a minimum distance of 50 feet from each nest to be undisturbed. This buffer dimension may be changed if determined appropriate by the wildlife biologist and approved by the Engineer. Work shall not proceed within the fenced buffer area until the young have fledged, or the nests have become inactive.

   If the fence is knocked down or destroyed by the Contractor, the Engineer will suspend the work, wholly or in part, until the fence is satisfactorily repaired at the Contractor’s expense. Time lost due to such suspension will not be considered a basis for adjustment of time charges but will be charged as contract time.

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

2. *Grasses and Other Vegetation Management*. Due to the potential for encountering ground nesting birds' habitat, if work occurs between April 1 and August 31, the area shall be surveyed by a wildlife biologist within the seven days immediately prior to ground disturbing activities.

   The undisturbed ground cover to 50 feet beyond the planned disturbance, or to the right of way line, whichever is less, shall be maintained at a height of 6 inches or less beginning April 1 and continuing until August 31 or until the end of ground disturbance work, whichever comes first.

   If birds establish a nest within the survey area, an appropriate buffer of 50 feet will be established around the nest by the CDOT biologist. This buffer dimension may be changed if determined appropriate by the CDOT biologist and approved by the Engineer. The Contractor shall install fence (plastic) at the perimeter of the buffer. Work shall not proceed within the buffer until the young have fledged or the nests have become inactive.

   If the fence is knocked down or destroyed by the Contractor, the Engineer will suspend the work, wholly or in part, until the fence is satisfactorily repaired at the Contractor's expense. Time lost due to such suspension will not be considered a basis for adjustment of time charges but will be charged as contract time.

(b) *Work on structures*. The Contractor shall prosecute work on structures in a manner that does not result in a taking of migratory birds protected by the Migratory Bird Treaty Act (MBTA). The Contractor shall not prosecute the work on structures during the primary breeding season, April 1 through August 31, unless he takes the following actions:

(1) The Contractor shall remove existing nests prior to April 1. If the Contract is not awarded prior to April 1 and CDOT has removed existing nests, then the monitoring of nest building shall become the Contractor's responsibility upon Notice to Proceed.

(2) During the time that the birds are trying to build or occupy their nests, between April 1 and August 31, the Contractor shall monitor the structures at least once every three days for any nesting activity.

(3) If the birds have started to build any nests, they shall be removed before the nest is completed. Water shall not be used to remove the nests if nests are located within 50 feet of any surface waters.

(4) Installation of netting may be used to prevent nest building. The netting shall be monitored and repaired or replaced as needed. Netting shall consist of a mesh with openings that are ¾ inch by ¾ inch or less.

If an active nest become established, i.e., there are eggs or young in the nest, all work that could result in abandonment or destruction of the nest shall be avoided until the young have fledged or the nest is unoccupied as determined by the wildlife biologist and approved by the Engineer. The Contractor shall prevent construction activity from displacing birds after they have laid their eggs and before the young have fledged.

If the project continues into the following spring, this cycle shall be repeated. When work on the structure is complete, the Contractor shall remove and properly dispose of netting used on the structure.

(c) *Taking of a Migratory Bird.* The taking of a migratory bird shall be reported to the Engineer. The Contractor shall be responsible for all penalties levied by the U. S. Fish and Wildlife Service (USFWS) for the taking of a migratory bird.

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

METHOD OF MEASUREMENT

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

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

Netting will be measured by the square yard of material placed to keep birds from nesting on the structure. Square yards will be calculated using the length of netting measured where it is attached to the ground and the average height of the netting where it is attached to the structure.

BASIS OF PAYMENT

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

Payment will be made under:

Pay Item	Pay Unit
Wildlife Biologist	Hour
Removal of Nests	Hour
Netting	Square Yard

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

Payment for Removal of Nests will be full compensation for all work and material required to complete the work.

Payment for netting will be full compensation for all work and material required to complete the item. Overlaps of netting will not be measured and paid for separately but shall be included in the work. Maintenance and replacement, removal, and disposal of netting will not be measured and paid for separately but shall be included in the work.

Clearing and grubbing will be measured and paid for in accordance with Section 201. Mowing will not be measured and paid for separately but shall be included in the work.

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

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

REVISION OF SECTION 306
RECONDITIONING

Section 306 of the Standard Specifications is hereby revised for this project as follows:

306.02 Construction Requirements

Replace the first two sentences of the paragraph with the following:

The soil below trail subgrade (basis of cuts) elevation shall be reconditioned by removing the soil to the required depth, processing and replacing the material to the required density. Processing shall include mixing and adjusting the material to within two (2) percent of the optimum moisture content. After processing, the material shall be placed in uniform layers and compacted to Minimum 95% of maximum dry density in accordance with AASHTO T 99 & T 310. Subgrade reconditioning shall be performed over the full width of the trail, including the area under the shoulders.

The depth of subgrade reconditioning shall be 12 inches unless otherwise specified in the contract documents or approved by the Engineer.

Add the following:

Proof Rolling. The Engineer or Construction Inspector may require proof rolling of the reconditioned subgrade to test for deflection. Proof rolling shall be in accordance with Subsection 203.08. If while proof rolling, any visible deflection or rutting is observed, additional reconditioning or recompaction of the subgrade may be required.

306.04 Basis of Payment.

Add the following:

The accepted quantities of reconditioning will be paid for at the contract unit price for reconditioning:

Payment will be made under:

Pay Item	**Pay Unit**
Reconditioning (12” deep)	Square yard

Proof rolling, when required, will not be measured or paid for separately but shall be included in the work.

REVISION OF SECTION 603
REINFORCED CONCRETE PIPE

Section 603 of the Standard Specifications is hereby revised for this project as follows:

Subsection 603.02 shall include the following:

Reinforced concrete pipe shall be manufactured from concrete that meets the requirements for severity of sulfate exposure Class 2 specified in subsection 601.04.

REVISION OF SECTION 608
SIDEWALKS AND BIKEWAYS

Section 608 of the Standard Specifications is hereby revised for this project as follows:

Subsection 608.03(a) Excavation, shall include the following:

All subgrade, including fill, under all concrete shall be adjusted to optimum moisture content and uniformly compacted to no less than 95 percent of the maximum density determined in accordance with AASHTO T-99 or T-180 as applicable. Bed course material shall be placed on the prepared subgrade to the dimensions shown on the standard drawings and compacted to a minimum of 95 percent of the maximum density determined in accordance with AASHTO T-180.

Subsection 608.03(c) Placing Concrete, shall include the following:

The concrete shall be thoroughly consolidated which shall be achieved by tamping and spading, vibrating or other acceptable methods.

Concrete shall not be placed on frozen ground or on frozen bed course.

Subsection 608.03(d) Finishing, shall include the following:

No water shall be placed on concrete surfaces during finishing operations. The Contractor shall keep plastic sheeting or other waterproof covering available on the job site to cover and protect the surface of freshly placed concrete against rain and/or dust storms.

Surface finishing shall be minimized to prevent dilution and weakening of the concrete mixture at the surface. Finishing with steel trowels shall not be allowed.

It shall be the Contractors responsibility to protect new concrete against vandalism, vehicular damage and defacement of any kind until it has been accepted by the Engineer. All damaged or defaced concrete shall be repaired or replaced, as directed, at the Contractor's expense.

When during concrete finishing operations, the air temperature, relative humidity and wind velocity result in an evaporation rate of 0.2 lb/ft2/hr or above, an approved evaporation reducer (see Subsection 711.03) shall be applied to the concrete surface to help prevent plastic shrinkage cracks. The evaporation rate can be determined from an evaporation chart published in ACI 305R. When an evaporation retarder is used, the concrete shall not be worked or finished until all water within the retarding admixture has evaporated from the surface.

Subsection 608.03, shall add the following paragraphs:

(g) *Backfilling.* After the concrete has set sufficiently, and forms have been removed, the spaces adjacent to the concrete curb, sidewalk, or path shall be immediately backfilled to the required elevation with suitable materials which shall be thoroughly compacted.

(h) *Concrete Extrusion Machine.* Concrete curbs, gutters, sidewalks, paths or combinations of these sections may be constructed using an extrusion machine. Machine placed concrete shall be jointed, cured and backfilled as specified herein.

(i) *Surface Tolerance.* Concrete shall be finished to a smooth and uniform surface, which shall at no point deviate from plan elevation more than one-fourth (¼) inch. On sidewalks and paths, no low spots or depressions shall be detectable when tested with a straight edge laid transverse to the longitudinal centerline. Sections of sidewalk

on which water ponds or does not drain from the surface, shall be removed and replaced at the Contractor's expense. The face and top of curbs and flowline of gutters shall not deviate more than one-fourth (¼) inch from a 10 ft. straight edge laid longitudinally along the concrete surface. The flowline of any concrete designed to convey water shall not be less than the design grade when the design grade is equal to or less than 1.00%. For design grades above 1.00%, the flowline shall not deviate by more than 0.50% up or down. The City Project Engineer and/or the Construction Inspector shall determine where surface tolerance testing is required. If testing is required, the Contractor shall furnish an approved 10 ft. straight edge and provide an operator to assist the Inspector. Surface tolerance shall be measured at all locations designated by the Inspector.

REVISION OF SECTION 613
PEDESTRIAN LIGHTING

Section 613 of the Standard Specifications is hereby revised for this project as follows:

Subsection 613.01 Description; The main paragraph shall be modified to the following:

This work consists of furnishing and installing foundations, light standards, luminaires, lamps, conduit, cable, wiring and incidental materials for pedestrian lighting in accordance with these specifications and in conformance with the details, lines, grades and locations shown on the plans or established.

Subsection 613.02 Materials, paragraph 1 shall be modified to the following:

Pedestrian lighting materials shall conform to the requirements of Section 715 and shall be compatible with the requirements of the local utility company unless otherwise noted in this section or on the electrical drawings.

Subsection 613.02 Materials; section (b) shall be modified to the following:

Light Standard. A complete light standard includes:

1. The pedestrian pole, luminaire head, base, grounding system, and all hardware; and
2. Bridge side rail lighting, wiring, grounding, NEMA 3R enclosures, 24V power supplies.

Subsection 613.02 Materials; section (i); Materials List shall be modified to the following:

Before releasing any materials, the Contractor shall submit to the Engineer for approval three copies of a complete list of all of the equipment and materials related to the installation of the pedestrian and bridge railing luminaries that he intends to install. This list shall include, but is not limited to, the following:

Light standards, anchor bolts, luminaire mountings, luminaire specifications, lamps, and ballasts

Luminaire photometric data on disc in IES format from an independent testing facility (if requested)

Cables, splicing, location wire and termination devices

Conduits, conduit bends and splices, and electrical bushings

Fuse holders, fuses and cable disconnect devices

Splice boxes

Wiring and connection diagrams of all circuits, luminaires, etc.

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

The Contractor shall supply manufacturer descriptions of luminaires, pole materials, assemblies, fabrication, performance, and installation. Submittals shall also indicate color for review and approval. The Engineer must approve all shop drawings, submittals, and material descriptions before the Contractor may order from supplier.

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

Luminaires' mountings and wiring

Light standards, distribution and accessories

Electrical wire and cable

REVISION OF SECTION 613
PEDESTRIAN LIGHTING

Luminaires, lamps and ballasts
Ground rods
Anchor bolts
Photometric data

Subsection 613.05 Light Standards shall include the following:

Light Standard assemblies shall be fabricated and placed in accordance with the details and dimensions shown on the landscape and electrical 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. The Contractor will also obtain and follow all installation information specified by the Manufacturer.

Prior to installation, all Light Standards shall be stored above ground, on skids in manufacturer's packaging to prevent damage.

Subsection 613.06 Luminaires, Light Sources, and Lamps shall include the following:

New pedestrian luminaires shall be anchored and secured to pole as indicated in manufacturer's instructions. Luminaires shall be adjusted vertically and horizontally to provide the required mounting height and maximum light distribution on the sidewalk.

New bridge guard rail lighting to be installed in bridge-manufacturer-provided access holes in the 1 ½ inch by 1 ½ inch metal tube as indicated in lighting manufacturer’s installation instructions. The rail lighting will be adjusted or rotated to provide the maximum light distribution on the bridge deck surface.

Subsection 613.14 shall include the following:

Electrical Contractor will be responsible for the materials and installation (furnish and install) of the pedestrian luminaires.

613.14 Payment will be made under:

Pay Item	**Pay Unit**
2 Inch Electrical Conduit (Plastic)	Linear Foot
Type One Pull Box	Each
Wiring	Lump Sum
Light Standard and Luminaire (Pedestrian)	Each
Light Standard Foundation (Special)	Each
Light Standard and Luminaire (Pedestrian BRIDGE)	Each

REVISION OF SECTION 628
BRIDGE GIRDER AND DECK UNIT

Section 628 is hereby added to the Standard Specifications for this project as follows:

DESCRIPTION

628.01 This work consists of the design, fabrication, and erection of a simple span, welded steel, truss pedestrian bridge with a concrete deck in accordance with the specifications and plan details.

628.02 Structural Steel. All structural steel shall be new (unused) material. The Contractor shall provide the Engineer with copies of all certified mill test reports for all structural steel and bolts. Floor beams, stringers, and members of each Half-through truss (upper and lower chords, diagonals, end posts and vertical posts) utilized in the bridges shall meet a longitudinal Charpy V-notch (CVN) value of 25 feet. pounds. at 40 degrees Fahrenheit. Testing shall be in accordance with AASHTO T 243 (ASTM A673). The H frequency of heat testing shall be used. The Contractor shall provide the Engineer with certified copies of all CVN test reports.

All anchor bolts, washers and nuts shall be galvanized in accordance with the requirements of ASTM A153. Each anchor bolt shall be provided with two nuts for jamming.

628.03 Concrete. All concrete shall conform to CDOT Class D requirements.

CONSTRUCTION REQUIREMENTS

628.04 Design. The *AASHTO LRFD Guide Specifications for the Design of Pedestrian Bridges* (AASHTO Guide Specifications) and the *AASHTO LRFD Bridge Design Specifications* (AASHTO Bridge Specifications) and shall govern the design.

The superstructure of the pedestrian bridge shall consist of two parallel Half-through trusses with at least one diagonal per panel. The trusses shall be the main load-carrying members of the bridge.

The members of each Half-through truss (upper and lower chords, diagonals, end posts, and vertical posts) shall be fabricated from square and rectangular structural steel tubing.

Floor beams and stringers shall be fabricated from structural steel shapes or square and rectangular structural steel tubing.

The structure shall conform to the clear span, clear width, structure depth, deck location and camber requirements shown on the plans.

Each pedestrian bridge shall be designed for the following loads and loading conditions:

1. Dead load shall be as defined in Section 3.5 of the AASHTO Bridge Specifications.

   No allowances for future wearing surface or utilities are required.

2. Live load shall be as defined in the AASHTO Guide Specifications. Distribution to the stringer and floor beams shall be in accordance with Sections 3 and 4 of the AASHTO Bridge Specifications. Deflection due to pedestrian live load and vibration limits as per the AASHTO Guide Specifications shall apply. Deflections due to occasional vehicular traffic shall not be considered.

Pedestrian live load shall be 90 psf.

Vehicle live load shall be as defined herein and as shown on the plans:

The vehicle live loads shall be the AASHTO H-5 Design Vehicle

The vehicle live loads shall be combined with other loads as defined herein. These vehicle live loads are not to be combined with the pedestrian live load. The dynamic load allowance (Impact) need not be considered for these vehicular loadings.

3. Wind load shall be as defined by the AASHTO Guide Specifications and used in combination with other loads in accordance with the AASHTO Bridge Specifications, Section 3.

   The horizontal deflections due to wind loads shall satisfy the deflection criteria in Section 5 of the AASHTO Guide Specifications.

4. Snow load shall be considered as an "Live Load" (LL) in accordance with the AASHTO Bridge Specifications, Section 3.9.6. This Live (Snow) Load shall be combined with other loads as defined by the AASHTO Bridge Specification "Strength I" Load Combination. This Live (Snow) Load shall not be applied simultaneously with the Pedestrian Live Load.

   Snow Load (LL) shall be 30 psf

5. Fatigue loading used for the fatigue and fracture limit state (Fatigue I) shall be in accordance with the AASHTO Guide Specifications. The fatigue importance factor, I_f, shall be taken as 1.0.

6. The structure shall be designed for all applicable load combinations.

5. Distribution of wheel loads on concrete deck shall be in accordance with Section 4 of the AASHTO Bridge Specifications.

Allowable loads in the structural steel members and weld metal shall be in accordance with Section 6 of the AASHTO Bridge Specifications.

Minimum thickness of structural steel shall be 3/16 of an inch.

½ inch diameter weep holes shall be drilled (flame cut holes will not be allowed) at all low points of all steel tubing members as oriented in the in-place, completed structure. In members that are level, or flat, a total of two weep holes shall be drilled, one at each end. Weep holes and their locations shall be shown on the Shop Drawings.

All welded tubular connections shall be designed in accordance with Section 2, Parts A and D (Delete Subsection 2.36.6), of the Structural Welding Code-Steel ANSI/AWS/D1.1 (Latest Edition).

Field splices shall be fully bolted and designed as slip-critical connections in accordance with Section 6 of the AASHTO Bridge Specifications.

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REVISION OF SECTION 628
BRIDGE GIRDER AND DECK UNIT

Bearings and anchor bolts shall be designed by the bridge manufacturer to satisfy the design loads and anticipated thermal movements of the superstructure. Details of the bearings and anchor bolts shall be provided to the Engineer prior to commencement of abutment construction to verify abutment design and dimensions. These details shall include the design reactions at the bearing locations.

The safety rail system shall be designed in accordance with Section 13 of the AASHTO Bridge Specifications.

Horizontal safety rails shall be placed on the structure up to a minimum height of 4'-6" above the deck surface. Safety rails shall be placed so as to prevent a 4" sphere from passing through the truss. Safety rails shall be angles welded to the inside or outside of the structure at the City's option. Provide Ipe wood Rub Rail as shown in the Construction Drawings.

The safety rail system shall be designed for an infill loading of 200 pounds, applied horizontally at right angles, to a one square foot area at any point in the system.

The Contractor shall submit five sets of Design Calculations and Shop Fabrication Details (Shop Drawings) to the Engineer. This submittal shall be in accordance with Subsection 105.02. The Design Calculations and Shop Drawings shall contain the endorsement seal of the Professional Engineer registered in the State of Colorado responsible for the design.

628.05 Shop Fabrication. Welding and fabrication of weathering steel pedestrian bridges shall conform to the requirements of the Structural Welding Code-Steel ANSI/AWS D1.1 (Latest Edition) as amended by the following:

1. As required in Subsection 4.7.3, a welding procedure shall be established by qualification in accordance with the requirements of Subsection 3.3 for the ASTM A 847 material used on the bridge. The results of the Procedure Qualification shall be recorded on Form E-1 in Annex E of AWS D 1.1.
2. The Contractor shall submit a Quality Control Plan. The Plan shall include personnel qualifications, certifications, and a Written Practice in accordance with ASNT SNT-TC-1A.
3. The quality of all welds shall be in accordance with Section 6, Table 6.1. In Table 6.1, Undercut 7(B), the criteria for primary members shall apply to the bottom chord members.
4. All Complete Joint Penetration Groove Welds in butt joints in the bottom chord members shall be 100% Magnetic Particle tested in accordance with ASTM E 709. Acceptance shall be determined in accordance with Section 6.10 and Table 6.1, using Alternating Current. In addition, complete joint penetration groove butt welds welded from one side without backing of bottom chord members shall be examined by ultrasonic testing in accordance with Section 6.11.1.
5. Magnetic Particle Testing shall be performed on 100% of all attachment welds to the bottom chord, using Alternating Current, in accordance with Section 6.10 and Table 6.1.
6. All Procedure Qualification Records and Welder Qualification Test Records shall be current within three years of the date of beginning fabrication.
7. A copy of all Procedure Qualification Records, Welder Qualification Test Records, Quality Control Plan and all visual and nondestructive test reports shall be provided to the Engineer.

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REVISION OF SECTION 628
BRIDGE GIRDER AND DECK UNIT

Steel surface preparation shall be in accordance with section 509.24 of the standard specification.

628.06 Field Construction. The substructure shall be constructed in accordance with the details shown in the plans and the pedestrian bridge shop drawings. Before construction begins on the substructure, the Contractor shall determine the anchor bolt requirements and substructure dimensions needed to properly erect the structure which will be provided. The Engineer shall be provided with two copies of detail sheets delineating these requirements before work begins.

MEASUREMENT AND PAYMENT

628.07 The accepted quantity shall be paid for at the contract unit price for the pay unit listed below. Payment will be made under:

Pay Item	**Pay Unit**
Bridge Girder and Deck Unit	Each

Payment shall be full compensation for all work necessary to complete the item, which shall include design, fabrication, transportation to the bridge site, and erection. The substructure shall be measured and paid for separately, anchor bolts shall be included in the work. Payment will not be made for this item until all required reports, certifications, and forms have been submitted to the Engineer.

REVISION OF SECTION 712
PVC GRAVITY SEWER PIPE

Section 712 of the Standard Specifications is hereby revised for this project as follows:

Subsection 712.13 shall include the following subsection:

(e) *PVC sewer pipe.* PVC sewer pipe and fittings shall conform to ASTM D-3034 Type PSM for diameters 4" to 15" and ASTM F-679 Type I for diameters 18" to 27". The minimum wall thickness for PVC pipe shall conform to Standard Dimension Ratio (SDR) 35. Joints shall be bell-and-spigot type with flexible elastomeric seals conforming to ASTM D-3212 and shall not be longer than 14 feet in length. Gaskets shall be neoprene or other synthetic rubber material conforming to ASTM F-477. The bells shall be integrally formed with the pipe or fitting.

REVISION OF SECTION 712
PRECAST CONCRETE MANHOLES FOR SANITARY SEWER

Section 712 of the Standard Specifications is hereby revised for this project as follows:

Subsection 712.05 shall include the following paragraphs:

Manhole risers, cones and flat tops shall be made with tongue and groove ends for continuous and uniform joints between sections. Joint configuration shall be consistent throughout each manhole, use of non-compatible manhole joints on new systems or modification to existing systems shall not be allowed. The joint sealant shall be a flexible, preformed, bitumastic joint sealant.

All cement used in mortar, and concrete used in concrete bases, and precast manhole riser sections, cones and flat tops, for sanitary sewer manholes, shall be Type V or modified Type II Portland Cement having less than five (5) percent tricalcium aluminate.

There shall be no infiltration into the manhole after construction of any sanitary sewer manhole. If there is visible infiltration, the manhole shall be repaired to stop visible infiltration at the Contractor's expense. Acceptable materials for repair shall include, but are not limited to, the use of Xypex Patch and Plug, QuickCrete Hydraulic Water Stop, or other materials or systems approved by the City Utility Engineer.

FORCE ACCOUNT ITEMS

DESCRIPTION

This special provision contains the Department's estimate for force account items included in the Contract. The estimated amounts will be added to the total bid to determine the amount of the performance and payment bonds. Force Account work shall be performed as directed by the Engineer.

F/A Minor Contract Revisions – Consists of minor work authorized and approved by the Engineer, which is not included in the contract plans or specifications, and is necessary to accomplish the scope of work of this contract.

BASIS OF PAYMENT

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

Force account work valued at $5,000 or less, that must be performed by a licensed journeyman in order to comply with federal, state, or local codes, may be paid for after receipt of an itemized statement endorsed by the Contractor.

Force Account Item	Quantity	Estimated Amount
F/A Minor Contract Revisions	F.A.	$ 60,000.00

TRAFFIC CONTROL PLAN - GENERAL

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

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

(1) Subsection 104.04 and Section 630 of the specifications.
(2) Standard Plan S-630-1, Traffic Controls for Highway Construction, Case 19 and Standard Plan S-630-2.
(3) Schedule of Construction Traffic Control Devices.

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

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

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

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

The Contractor shall not perform any work requiring lane closure on the roadway between the hours of 7 AM and 9 AM and between 3 PM and 6 PM or as directed.

At least one week prior to starting construction, the Contractor shall notify the City of Grand Junction PIO of the date the Contractor intends to start construction.

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

UTILITIES

Known utilities within the limits of this project are:

City of Grand Junction Sanitary Sewer

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

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

FOR:

No utility work for private utility owners is expected for this project. The Contractor shall extend the existing City of Grand Junction Sanitary Sewer as shown in the Project Plans.

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

No utility work by private utility owners is expected for this project.

GENERAL:

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

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

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

The Utility Contact List is as follows for this project:

Utility	Contact Name	Phone	Email
Ute Water	Dave Priske	970-242-7491	dpriske@utewater.org
Charter	Mark Kostelecky	970-623-9415	mark.kostelecky@charter.com
	Jeff Valdez	970-263-2314	jeff.valdez@charter.com
Xcel Energy (Gas/Electric)	Sarah Darricau	970-244-2656	Sarah.m.darricau@xcelenergy.com
	Brenda Boes	970-260-6177	Brenda.k.boes@xcelenergy.com
CenturyLink	Chris Johnson	970-244-4311	Chris.Johnson5@centurylink.com
Grand Valley Power	Mike Gardner	970-623-8565	mgardner@gvp.org
Grand Valley Irrigation	Phil Bertrand	970-242-2762	
City of Grand Junction	Lee Cooper	970-256-4155	leec@gjcity.org

REVISION OF SECTION 103
COLORADO RESIDENT BID PREFERENCE

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

Subsection 103.01 shall include the following:

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

Resident bidder means:

(1) A person, partnership, corporation, or joint venture which is authorized to transact business in Colorado and which maintains its principal place of business in Colorado: or,

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

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

The proposals will be treated as follows:

(1) All proposals will be checked for accuracy by the Department.

(2) The dollar amount of the checked proposal from nonresident bidders will be adjusted by a percentage equal to the percentage preference given or required by the state or foreign country of the bidder's residency. If the state or foreign country does not give or require a residency preference, no adjustment in the proposal dollar amount will be made.

(3) Adjusted proposals from nonresident bidders will then be compared to proposals from resident bidders, and the bidder with the lowest total will be considered the apparent low bidder.

(4) Should a nonresident bidder be the apparent low bidder, in accordance with paragraph (3) above, an award will be made on the basis of the original proposal, not the adjusted proposal.

(5) The Department will proceed with its normal award procedure.

Revise Section 105 of the Standard Specifications as follows:

Revise Paragraphs 4, 5 and 6 of Subsection 105.20 as follows:

If damage occurs to an existing structure through improper maintenance per 105.19, the Contractor shall submit a repair procedure to the Engineer to repair the defect(s).

The repair categories and requirements are defined as follows:

a) *"In-kind" repairs*. In-kind repairs are repairs where the As-Built or Advertised plans are utilized to replace or repair damaged components with identical dimensions and materials used plans and where no plan modifications are made. In-kind repair procedures shall be reviewed and accepted by the Engineer before any repair. The use of approved repair grouts or doweled reinforcing with epoxy adhesive is permitted in in-kind repairs. Doweled reinforcing shall meet or exceed the strength requirements of the original design.

a) "*Modified repairs*". Modified repairs are those which deviate in dimensions and/or materials from the As-Built or Advertised plans or where plans are not available. Modified repair procedure submittals shall include calculations, independent design calculations, shop drawings, and/or working drawings per 105.02, and any other applicable section of the specifications for the needed repair. The Contractor's Engineer shall electronically seal Modified repair submittals.

Damage to new structures or modified structures, shall be repaired per the contract documents. The Engineer of Record shall be notified and review all corresponding submittals before any repairs.

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REVISION OF SECTION 106
BUY AMERICA REQUIREMENTS
NON-FEDERAL AID

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

Delete subsection 106.11(a) and replace it with the following:

(a) Federal *Buy America* requirements for iron and steel do not apply to this project.

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REVISION OF SECTION 106
COUNTRY OF ORIGIN

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

Subsection 106.11 shall include the following:

(c) *United States of America and Foreign Item Reporting.* The Contractor shall make a good faith effort to provide a list of the five costliest items incorporated into the project that consist of 50 percent or more steel or iron when delivered to the construction site. This list shall include the item name, the cost, and the country of origin of the item. The following shall be used to establish the country of origin of the item:

(1) If the item is completely iron or steel, it will be considered to have been manufactured in the United States if all of the manufacturing processes for the final product took place in the United States.

(2) If the product is only partially made of steel or iron, it shall be considered to have been manufactured in the United States if all of the manufacturing processes for the final product took place in the United States, irrespective of the country of origin of the item's subcomponents.

The list of items shall be submitted within 15 days of the final acceptance date.

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

Delete subsection 109.06(e) and replace with the following:

(e) *Prompt Payment*. The Contractor shall pay subcontractors and suppliers for all work which has been satisfactorily completed within seven calendar days after receiving payment for that work from the Local Public Agency (LPA). For the purpose of this section only, work shall be considered satisfactorily complete when the LPA has made payment for the work. The Contractor shall include in all subcontracts a provision that this requirement for prompt payment to subcontractors and suppliers must be included in all subcontracts at every tier. The Contractor shall ensure that all subcontractors and suppliers at every tier are promptly paid. If the Contractor or its subcontractors fail to comply with this provision, the Engineer will not authorize further progress payment for work performed directly by the Contractor or the noncompliant subcontractor until the required payments have been made. The Engineer will continue to authorize progress payments for work performed by compliant subcontractors.

Delete subsection 109.06(f)5 and replace with the following:

5. In determining whether satisfactory completion has been achieved, the Contractor may require the subcontractor to provide documentation such as certifications and releases, showing that all laborers, lower-tiered subcontractors, suppliers of material and equipment, and others involved in the subcontractor's work have been paid in full. The Contractor may also require any documentation from the subcontractor that is required by the subcontract or by the Contract between the Contractor and the LPA or by law such as affidavits of wages paid, material acceptance certifications and releases from applicable governmental agencies to the extent that they relate to the subcontractor's work.

Delete subsection 109.06(f)8 and replace with the following:

8. If additional quantities of a particular item of work are required at a later date after final measurement has been made, the Contractor shall perform this work in accordance with Contract requirements and at unit bid prices.

   For this subsection only, satisfactory completion of all work described on CDOT Form No. 205 is when all tasks called for in the subcontract as amended by changes directed by the Engineer have been accomplished and documented as required by the LPA.

   The requirements stated above do not apply to retainage withheld by the LPA from monies earned by the Contractor. The LPA will continue to process the release of that retainage based upon the completion date of the project as defined in the Commencement and Completion of Work special provision.

Delete subsection 109.06(f)9 and replace with the following:

9. If during the prosecution of the project a portion of the work is partially accepted in accordance with subsection 105.21(a), the Contractor shall release all subcontractors' retainage on the portion of the partially accepted work performed by subcontractors. Prior to the LPA releasing the Contractor's retainage on work that has been partially accepted in accordance with subsection 105.21(a), the Contractor shall submit to the Engineer a certified statement for each subcontractor that has participated in the partially accepted work. The statement shall certify that the subcontractor has been paid in full for its portion of the partially accepted work including release of the subcontractor's retainage. The statement shall include the signature of a legally responsible official for the Contractor, and the signature of a legally responsible official for the subcontractor.

Delete subsection 109.06(g) and replace with the following:

(g) *Good Cause Exception.* If the Contractor has "good cause" to delay or withhold a subcontractor's progress payment, the Contractor shall notify the LPA and the subcontractor in writing within seven calendar days after receiving payment from the LPA. The notification shall specify the amount being withheld and provide adequate justification for withholding the payment. The notice shall also clearly state what conditions the subcontractor must meet to receive payment. "Good cause" shall include but not be limited to the failure of the subcontractor to make timely submission of required paperwork.

Delete subsection 109.06(h) and replace with the following:

(h) *Monthly Reporting.* On a monthly basis, the Contractor shall submit the Form 1418, Monthly Payment Report, to the Engineer along with the project schedule updates, in accordance with subsections 108.03(g). Failure to submit a complete and accurate Form 1418 shall be grounds for CDOT to withhold subsequent payments or retainage from the Contractor.

Section 207 of the Standard Specifications is hereby deleted for this project and replaced with the following:

DESCRIPTION

207.01 This work consists of salvaging topsoil from onsite locations, stockpiling, maintaining, and preparing the subsoils for the placement of the topsoil at locations shown on the plans. It also includes creating seeding media by amending subsoils, and importing offsite topsoil when shown on the plans.

Substitutions from this specification will not be allowed unless submitted in writing to the Engineer and approved by the Region or Headquarters Landscape Architect.

MATERIALS

207.02 General. Topsoil shall be salvaged onsite, imported, or produced as shown on the plans. Topsoil shall be free of refuse and litter along with noxious weed seed and reproductive plant parts, as listed in current State of Colorado A and B Noxious Weed List and local agency weed lists. Topsoil shall not include heavy clay, hard clods, toxic substances, pathogens, or other material, which would be detrimental to growing native vegetation. All required amendments shall be thoroughly incorporated to parent material, onsite. All amendments shall conform to Section 212. Topsoil and parent material shall be free of clods, sticks, stones, debris, concrete, and asphalt in excess of 4 inches in any dimension for all material used within the designed clear zone for the project. Topsoil outside of the clear zone may contain rock larger than 4 inches in any dimension. For slopes with no structures being used to protect areas from falling rocks the Contractor shall remove or secure any rocks deemed unstable and could pose a safety hazard.

Topsoil shall be generated from one or more of the following as shown on the plans:

(a) *Topsoil (Onsite).* Topsoil shall consist of the upper 6-inch layer of the A horizon, as defined by the Soil Science Society of America, or at the depths and locations shown on the Stormwater Management Plan (SWMP). It shall consist of loose friable soil, salvaged from onsite and stockpiled or windrowed. Litter and duff (layer of partially decomposed plant material) shall be collected as part of the salvaging of topsoil unless specified to be removed and hauled offsite on the plans.

(b) *Topsoil (Wetland).* Wetland topsoil shall consist of moist, organic soil obtained from delineated wetlands, including any existing wetland vegetation and seeds. Wetland topsoil shall be extracted from the project site at locations shown on the plans or as directed, to a minimum depth of 12 inches or at the depths as shown on the plans.

(c) *Seeding Media.* Seeding Media shall consist of one or all of the following approved materials: sub-soil, overburden, or material generated from rock. Contractor shall select onsite or offsite locations to generate material that meet the requirements of Table 207-1. The Contractor shall provide a Certified Test Report (CTR) in accordance with subsection 106.13, excluding lot, heat, and batch confirming that the excavated material conforms to Table 207-1.

(d) *Topsoil (Offsite).* The Contractor shall submit a CTR for Topsoil (Offsite) for approval a minimum of 60 days prior to import in accordance with subsection 106.13. The Contractor shall include with the CTR a complete Soil Nutrient Analysis for the properties listed in Table 207-2 from an independent laboratory that participates in the National Association for Proficiency Testing (NAPT). If topsoil nutrient analysis is deficient, an Amendment Protocol shall be submitted by the Contractor for approval. The Amendment Protocol shall contain a complete list of amendments and associated quantities to produce topsoil that conforms to Table 207-2.

The Contractor shall submit a Certificate of Compliance (COC) for Topsoil (Offsite) for approval a minimum of 60 days prior to import that the source has controlled noxious weeds in accordance with the State of Colorado Noxious Weed Act 35-5.5-115.

Table 207-1
PHYSICAL PROPERTIES OF SEEDING MEDIA

Property	Range	Test
Soil pH (s.u.)	5.6 – 7.5	ASA Mono. #9, Part 2, Method 10-3.2 or TMECC 04.11-A
Soil Electrical Conductivity (EC) (mmhos/cm or ds/m)	< 5.0	ASA Mono. #9, Part 2, Method 10-3.3
Soil SAR (s.u.)	0 - 10	ASA Mono. #9, Part 2, Method 10-3.4
Rock Content (%)	≤ 25	USDA NRCS Rock Fragment Modifier Usage
Trace Contaminants (Arsenic, Cadmium, Copper, Mercury, Selenium, Zinc, Nickel, and Lead)	Meets US EPA, 40 CFR 503 Regulations	TMECC 04.06 or EPA6020/ASA (American Society of Agronomy)
Rock Content (%) greater than 3" diameter	≤ 25	USDA NRCS Rock Fragment Modifier Usage
USDA Soil Texture	No more than 70% clay, silt, and sand by percentage volume of topsoil.	ASA Monograph #9, Part 1, Method 15-4 or ASA 1 43-5
All Particle Sizes	< 6 Inches	
Physical contaminants (man-made inerts) (%)	< 1	TMECC 03.08-C
C:N ratio	<20	TMECC 05.02-A
* Fines % when manufacturing material from rock	>25% material passing through #4 sieve	ASTM D6913

Amendments to the base imported material shall have the quantities of material verified onsite prior to incorporation into parent material, either at the stockpiles or after placement of parent material. Topsoil amended at the stockpiles shall be distributed to the site within seven days. * Substitute this requirement for USDA Soil Texture requirement when project are approved to use material manufactured from native rock material on site.

Table 207-2
TOPSOIL (OFFSITE) PROPERTIES

Property	Range	Test Methods
Soil pH (s.u)	5.6 – 7.5	ASA Mono. #9, Part 2, Method 10-3.2 or TMECC 04.11-A
Salt by Electrical Conductivity (EC) (mmhos/cm or ds/m)	< 2.0	ASA Mono. #9, Part 2, Method 10-3.3
Soil SAR (s.u.)	0 – 10	ASA Mono. #9, Part 2, Method 10-3.4
Soil OM (%)	3 – 5	Methods of Soil Analysis, Part 3, Method 34
Soil N (NO_3-n, ppm)	≥ 20.0	Methods of Soil Analysis, Part 3. Chemical Methods. Ch. 38 Nitrogen – Inorganic Forms
Soil P (ppm)	≥ 13.0	ASA Mono. #9, Part 2, Method 24-5.4 or others as required based on soil pH
Soil K (ppm)	≥ 80	ASA Mono. #9, Part 2, Method 13-3.5
Rock Content (%) greater than 3" diameter	≤ 25	USDA NRCS Rock Fragment Modifier Usage
Bioassay (seedling emergence and relative vigor)	> 80% of control	TMECC 05.05-A or Approved Germination Test
Soil Texture	No more than 70% clay, silt and sand by percentage volume of topsoil	ASA Mono. #9, Part 1, Method 15-4
Physical contaminants (man-made inerts) (%)	< 1	TMECC 03.08-C
Trace Contaminants (Arsenic, Cadmium, Copper, Mercury, Selenium, Zinc, Nickel, and Lead)	Meets US EPA, 40 CFR 503 Regulations	TMECC 04.06 or EPA6020/ASA (American Society of Agronomy)
All Particle Sizes	< 6 Inches	
C:N ratio	<20	TMECC 05.02-A

The Contractor shall utilize a rod penetrometer for determining subgrade soil preparation and determining looseness of soil after ripping. The penetrometer shall have a psi pressure gage, and shall meet the following requirements:

(1) Steel rod with a minimum diameter of ½ inch with graduations (tick marks) every 6 inches.

(2) The rod shall be made of stainless steel or other metal that will not bend when weight is applied.

(3) The end of the rod shall have a 30-degree cone tip.

(4) The diameter of the cone at its tip shall be no more than 0.1 inch.

(5) The top of the rod shall be a T-handled configuration.

CONSTRUCTION REQUIREMENTS

207.03 Site Pre-vegetation Conference. Prior to the start of the initial Subgrade Soil Preparation for the project, the Contractor shall request a Site Pre-vegetation Conference. The Engineer will set up the conference and will include: the Engineer or designated representative, the Superintendent or designated representative, the sub-contractor(s) performing the subgrade soil preparation and soil amendments, and the CDOT Landscape Architect representing the Region. Only one meeting is required for the project unless a new sub-contractor is brought on that did not attend the previous meeting.

The Agenda of the Pre-vegetation Conference can be found in Appendix A of the Construction Manual and includes the following:

(1) Final review of the Topsoil (Offsite) Amendment Protocol

(2) Review of the Method Statement detailing the equipment which will be used for the subgrade soil preparation operations

(3) Review of rod penetrometer which will be used to determine subgrade soil preparation of topsoil

(4) Permanent Stabilization Phasing Plan (identify strategies and site management measures to protect de-compacted, topsoil amended, seeded, and blanketed areas from foot, vehicle loads, and other disturbances).

(5) Seeding. See subsection 212.03 for submittal requirements.

(6) Meeting attendee sign-in log

207.04 Topsoil Stockpiling. Stockpiles of topsoil shall be created as shown on the plans or as approved by the Engineer. All Stockpiles of topsoil which are scheduled to remain in place for 14 days or more shall receive interim stabilization in accordance with subsection 208.04. All topsoil stockpiles shall be identified using white pin flags with "TOPSOIL" printed in black letters and shall have their locations shown on the SWMP Plans. Each individual stockpile shall require at least one flag, and one additional flag for each 10 cubic yards of salvaged topsoil. The contractor shall provide only perimeter flags for stockpile larger than 100 cubic yards with a minimum spacing of 25 feet.

Topsoil may be placed in stockpiles or windrowed at the edge of the disturbance. Windrowed topsoil shall not be used as perimeter erosion control or extensively compacted. When topsoil is windrowed, all stockpile requirements still apply.

(1) Upland Topsoil. If included on the plans, stockpiles shall be treated with herbicide, in accordance with Section 217, or as directed.

(2) Wetland Topsoil. Wetland stockpiles shall not be treated with herbicide. Weeds shall be hand pulled. Wetland topsoil shall be placed within 24 hours from excavation, unless otherwise approved by the Engineer. Wetland topsoil shall not be stockpiled for more than six months.

207.05 Subgrade Soil Preparation. Before placement of topsoil, the subgrade shall be ripped to a minimum depth of 14 inches. Subgrade shall be mostly dry and friable. Subgrade shall crumble without sticking together, yet not be so dry and hard that it does not break apart easily.

Underground utilities shall be located prior to soil preparation.

Subgrade soil preparation equipment shall meet the requirements for either winged tip or parabolic shanks. Operation shall be performed to fracture the soil uniformly without lifting or furrowing the surface excessively. The Contractor shall submit a method statement for subgrade soil preparation other equipment will be considered.

1. Winged tip shanks (dozer equipment) shall be a minimum of 6 inches wide and have 2 inches of vertical profile change on the blade with a 40 – 60-degree sweep angle.

The Contractor shall calibrate the subgrade soil preparation equipment using a minimum 30 linear feet of the initial pass. The Contractor shall utilize the rod penetrometer to verify that that de-compaction was successfully done. The Contractor shall take penetration measurements every 6 inches across a transect perpendicular to the direction of the tractor and spanning the width of the subgrade soil preparation. Depths of penetration shall confirm that a minimum of 12 inches can be achieved without reaching 300 psi on the rod penetrometer pressure gage (approximately 30 pounds of pressure on the T-handle).

Existing subgrade shall be de-compacted to a depth of 14 inches. If multiple passes are needed, the subsequent passes shall be positioned so that the ripping equipment (subsoilers) from the previous pass are split by the subsequent pass. Following ripping, the Contractor shall remove all sticks, stones, debris, clods, and all other substances greater than 6 inches in diameter. The Contractor shall restrict motorized vehicle and foot traffic from passing over the ripped area since this would recompact the areas that received subgrade soil preparation.

The first 4 feet from the edge of pavement shall be ripped to a depth of 6 inches. If the project is going to use aggregate base course or recycled asphalt as a shouldering technique, those areas will not require subgrade soil preparation. Depth of soil ripping for the subgrade soil preparation shall be checked with the rod penetrometer.

The Contractor shall verify adequate de-compaction of the entire area to have topsoil placed using a rod penetrometer in the presence of the Engineer. Tests shall be performed at a minimum of ten random locations per each acre as selected by the Engineer. The Test shall verify that a depth of 12 inches of penetration into the soil can be achieved without reaching 300 psi on the rod penetrometer pressure gage (approximately 30 pounds of pressure on the T-handle). If this depth cannot be achieved for 80 percent of the penetrations, the Contractor shall re-rip the area at no additional cost to the Department.

207.06 Placement of Topsoil and Seeding Media. Topsoil and Seeding Media shall be hauled and placed at the locations disturbed and will be re-vegetated or as shown on the plans. The contractor shall place a minimum thickness of 6 inches and should only be handled when it is dry enough to work without damaging soil structure. Topsoil and Seeding Media shall be placed a minimum depth of twelve (12) inches when placed over riprap as required on the plans. No Topsoil or Seeding Media shall be placed below ordinary high water mark except as otherwise specified in bio-stabilization bank treatments.

Salvaged topsoil placement deeper than 6 inches is allowed if additional approved material is on-site.

Contractor shall place topsoil in a method that does not re-compact subgrade material using low ground-contact pressure equipment, or by excavators and/or backhoes operating adjacent to it.

The final grade shall be free of all materials greater than 4 inches in diameter within the designed clear zone for the project. Equipment not required for revegetation work will not be permitted in the areas of placed topsoil.

Soil amendments, seedbed preparation, and permanent stabilization mulching shall be accomplished within four working days of placing the topsoil on the de-compacted civil subgrades. If placed topsoil is not mulched with permanent stabilization mulch within four working days, the Contractor shall complete interim stabilization methods in accordance with subsection 208.04(e), at no additional cost to the Department. Time to perform the work may be extended for delays due to weather.

METHOD OF MEASUREMENT

207.07 Topsoil material will be measured by the actual number of cubic yards of topsoil placed and accepted. Subgrade soil preparation will be measured by the square yards of subgrade which is ripped and accepted for adequate de-compaction.

BASIS OF PAYMENT

207.08 The accepted quantities measured 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**
Topsoil (Onsite)	Cubic Yard
Seeding Media	Cubic Yard
Topsoil (Offsite)	Cubic Yard
Topsoil (Wetland)	Cubic Yard
Subgrade Soil Preparation	Square Yard

Amendments for Topsoil (Onsite) and Seeding Media will be measured and paid for in accordance with Section 212.

Amendments for Topsoil (Offsite) will not be measured and paid for separately, but shall be included in the work.

Noxious Weed Management will be measured and paid for in accordance with Section 217.

Stockpiling or windrowing of topsoil will not be measured and paid for separately, but shall be included in the work.

Testing of Seeding Medial and Topsoil (Offsite) will not be measured and paid for separately but shall be included in the work.

Rod penetrometer and associated verification testing of random locations will not be measured and paid for separately, but shall be included in the work.

The Site Pre-vegetation Conference will not be paid for separately, but shall be included in the work.

Additional passes with the ripping equipment to achieve the desired de-compaction will not be measured and paid for separately, but shall be included in the work.

Removing of clods, sticks, stones, debris, concrete, and asphalt in excess of 4 inches in any dimension for all topsoil and Seeding Media used within the designed clear zone for the project will not be measured and paid for separely, but shall be included in the work.

Section 212 of the Standard Specifications is hereby deleted for this project and replaced with the following:

DESCRIPTION

212.01 This work consists of application of fertilizer, soil amendments, seedbed preparation, and placing seed and sod.

Substitutions from this specification will not be allowed unless submitted in writing to the Engineer and approved by the Region or Headquarters Landscape Architect.

MATERIALS

212.02 Seed, Fertilizers, Soil Conditioners, Mycorrhizae, Elemental Sulfur, and Sod.

(a) *Seed.* Seed shall be delivered to the project site in sealed bags tagged by a registered seed supplier conforming to the requirements of the Colorado Seed Act, CRS 35-27-111(1). Seed used on the project shall not be in the Contractor's possession for more than 30 days from the date of pickup or delivery on the seed vendors packing slip. Bags which have been opened or damaged prior to Engineer inspection will be rejected. The State required legal tags shall remain on the bag until opened and the seed is placed in either the drill or hydraulic seeders in the presence of the Engineer. The Engineer shall remove all tags after seed has been planted. Each seed tag shall clearly show the following:

(1) Name and address of the supplier

(2) Botanical and common name for each species

(3) Lot numbers

(4) Percent by weight of inert ingredients

(5) Guaranteed percentage of purity and germination

(6) Pounds of Pure Live Seed (PLS) of each seed species

(7) Total net weight in pounds of PLS in the sealed bag

(8) Calendar month and year of test date

Seeds shall be free from all noxious weed seeds in accordance with Colorado Seed Act (CRS 35-17) prohibited noxious weed seed list.

Weed seed content shall not exceed the requirements in part 7.2 of the Colorado Department of Agriculture's Seed Act Rules and Regulations.

Seed which has become wet, moldy, or damaged in transit or in storage will not be accepted.

Seed and seed labels shall conform to all current State regulations and to the testing provisions of the Association of Official Seed Analysis. Computations for quantity of seed required on the project shall include the percent of purity and percent of germination.

The Contractor shall store seed under dry conditions, at temperatures between 35 °F to 90 °F, under low humidity and out of direct sunlight. The Contractor shall provide the location of where seed is stored and access to stored seed locations to the Engineer. Seed stored by the Contractor for longer than 30 days will be rejected.

(b) *Organic Fertilizer*. Fertilizer derived directly from plant or animal sources shall conform to Colorado Revised Fertilizer Rules 8 CCR 1202-4. Fertilizer shall be uniform in composition and shall be delivered to the site in the original, unopened containers, each bearing the manufacturer's name, address, and nutrient analysis. Fertilizer bags (containers) which arrive at the project site opened, damaged, or lacking a label will be rejected. The Contractor shall only use bulk shipments such as tote bags or super sacks that have a manufacturer's original label and sealed at the manufacturing facility. Fertilizer which becomes caked or damaged will not be accepted. Fertilizer shall be stored according to manufacturer's recommendations in a dry area where the fertilizer will not be damaged.

Organic fertilizer formulation being submitted for use must be registered with the Colorado Department of Agriculture.

Verification tests may be conducted by CDOT on grab samples of organic fertilizer delivered to the site to determine the reliability of bag label analysis and for ingredients which are injurious to plants. If a product of any supplier is found to consistently deviate from the bag level analysis, the acceptance of that product will be discontinued. Copies of the failing test reports will be furnished to the Colorado State Board of Agriculture for appropriate action under the "Colorado Fertilizer Law".

Fertilizer shall be supplied in one of the following physical forms:

(1) A dry free-flowing granular fertilizer, suitable for application by agricultural fertilizer spreader.

(2) A homogeneous pellet, suitable for application by agricultural fertilizer spreader. Pellet size shall be 2-3 mm. Smaller may be allowed when Seeding (Native) Hydraulic is shown on the plans.

(3) A soluble form that will permit complete suspension of insoluble particles in water, suitable for application by power sprayer.

The application rate of the organic fertilizer shall be either as high or low nitrogen (N) fertilizer as shown on the plans.

High N organic fertilizer chemical analysis shall conform to Table 212-1.

Table 212-1
Chemical Analysis for High N Fertilizer

Ingredient	Range	Test Method
Nitrogen (N) (%)	6 - 10	AOAC Official Method 993.13 Nitrogen (Total) in Fertilizers Combustion Method
Phosphorus (P) (%)	1 - 8	AOAC Official Method 960.03 Phosphorus (Available) in Fertilizers
Potassium (K) (%)	1 - 8	AOAC Official Method 983.02 Potassium in Fertilizers

Low N organic fertilizer chemical analysis shall conform to Table 212-2.

Table 212-2
Chemical Analysis for Low N Fertilizer

Ingredient	Range	Test Method
Nitrogen (N) (%)	2 -5	AOAC Official Method 993.13 Nitrogen (Total) in Fertilizers Combustion Method
Phosphorus (P) (%)	3 - 8	AOAC Official Method 960.03 Phosphorus (Available) in Fertilizers
Potassium (K) (%)	1 - 8	AOAC Official Method 983.02 Potassium in Fertilizers

Organic fertilizers shall conform to Table 212-3.

Table 212-3
Organic Fertilizer Properties

Criteria	Range
Moisture content by weight	< 6%

(c) *Compost (Mechanically Applied).* Compost shall be suitable for use in Erosion Log (Type 2) and permanent seeding applications. Compost shall not contain visible refuse, other physical contaminants, or substances considered harmful to plant growth. Compost shall be used in accordance with all applicable EPA 40 CFR 503 standards for Class A biosolids including the time and temperature standards. Materials that have been treated with chemical preservatives as a compost feedstock will not be permitted.

The Contractor shall provide material that has been aerobically composted in a commercial facility. Compost shall be from a producer that participates in the United States Composting Council's (USCC) Seal of Testing Assurance (STA) program. The Department will only accept STA approved compost that is tested in accordance with the USCC Test Methods for Examining of Composting and Compost (TMECC) manual.

Verification tests may be conducted by CDOT on grab samples of compost delivered to the site to determine the gradation and physical properties. Testing may be done for indication of ingredients which are injurious to plants. Sampling procedures will follow the STA 02.01 Field Sampling of Compost Materials and 02.01-B Selection of Sampling Locations for Windrows and Piles. If a product is found to consistently deviate from the gradation and property analysis, the acceptance of that product will be discontinued. Copies of the failing test reports will be furnished to the USCC.

1. Compost for permanent seeding soil conditioner locations onsite and application rates shall be as shown on the plans.

   Organic matter in compost shall be no more than 2 inches in length.

   Compost (Mechanically Applied) for permanent seeding shall meet the gradation and physical properties as shown in Table 212-4 and Table 212-5. The Contractor shall provide a written explanation for compost tested parameters not within the acceptable requirements for review and consideration.

   The Contractor shall provide documentation from the composting facility confirming that the material has been tested in accordance with USCC TMECC.

Table 212-4
Gradation for Permanent Seeding Compost

Sieve Size	Percent Passing		
	Minimum	Maximum	Test Method
25.0 mm (1")	100		TMECC 02.02-B, "Sample Sieving for Aggregate Size Classification"
19.0 mm (3/4")	90	100	
6.25 mm (1/4")	70	100	

Note: Compost shall be from a producer that participates in the USCC STA program.

Table 212-5
Properties for Permanent Seeding Compost

Compost Parameters	Reported as	Requirements	Test Method
pH	pH units	6.0 - 8.5	TMECC 04.11-A
Soluble Salts (Electrical Conductivity)	dS/m (mmhos/cm)	< 5.0	TMECC 04.10-A
Moisture Content	%, wet weight basis	25% - 50%	TMECC 03.09-A
Organic Matter Content	%, dry weight basis pounds per cubic yard	20% - 50% >240	TMECC 05.07-A
Carbon to Nitrogen Ratio (C:N)		< 15:1	
Man-made Inert Contamination (plastic, concrete, ceramics, metal, etc.)	%, dry weight basis	< 1%	TMECC 03.08-A
Stability (respirometry)	mg CO_2-C per g TS per day mg CO_2-C per g OM per day	8 or below	TMECC 05.08-B
Select Pathogens and weed free	(PASS/FAIL) Limits: Salmonella < 3 MPN/4 grams of TS, or Coliform Bacteria < 1000 MPN/gram	Pass	TMECC 07.01-B Fecal Coliforms, or 07.02 Salmonella
Trace Metals	(PASS/FAIL) Limits (mg $kg^{-1,}$ dw basis): Arsenic (As) 41, Cadmium (Cd) 39, Copper (Cu)1500, Lead (Pb) 300, Mercury (Hg) 17, Nickel (Ni) 420, Selenium (Se) 100, Zinc (Zn) 2800	Pass	TMECC 04.06
Maturity (Bioassay) Percent Emergence Relative Seedling Vigor	 %, (average) %, (average)	 > 80% > 80%	TMECC 05.05-A
Use the STA Lab bulk density lb/cu ft as received, multiplied by organic matter % as received, multiplied by 27 to calculate pounds per cubic yard of organic matter.			

2. Compost for Erosion Log (Type 2) shall meet the gradation and physical properties as shown in Table 212-6 and Table 212-7.

Table 212-6
Gradation for Erosion Log (Type 2) Compost

Sieve Size	Percent Passing		
	Minimum	Maximum	Test Method
75.0 mm (3")	100		TMECC 02.02-B, "Sample Sieving for Aggregate Size Classification"
25.0 mm (1")	90	100	
9.5 mm (3/8")	10	50	

Note: Organic matter for erosion log compost shall be no more than 4 inches in length. Compost shall be from a producer that participates in the USCC STA program.

Table 212-7
Properties for Erosion Log (Type 2) Compost

Compost Parameters	Reported as	Requirements	Test Method
pH	pH units	6.0 - 8.5	TMECC 04.11-A
Soluble Salts (Electrical Conductivity)	dS/m (mmhos/cm)	< 5.0	TMECC 04.10-A
Moisture Content	%, wet weight basis	< 60%	TMECC 03.09-A
Organic Matter Content	%, dry weight basis	25% - 100%	TMECC 05.07-A
Man-made Inert Contamination (plastic, concrete, ceramics, metal, etc.)	%, dry weight basis	< 0.5%	TMECC 03.08-A
Stability (respirometry)	mg CO_2-C per g TS per day mg CO_2-C per g OM per day	N/A	TMECC 05.08-B
Select Pathogens and weed free	(PASS/FAIL) Limits: Salmonella < 3 MPN/4 grams of TS, or Coliform Bacteria < 1000 MPN/gram	Pass	TMECC 07.01-B Fecal Coliforms, or 07.02 Salmonella
Trace Metals	(PASS/FAIL) Limits (mg $kg^{-1,}$ dw basis): Arsenic (As) 41, Cadmium (Cd) 39, Copper (Cu)1500, Lead (Pb) 300, Mercury (Hg) 17, Nickel (Ni) 420, Selenium (Se) 100, Zinc (Zn) 2800	Pass	TMECC 04.06
Maturity (Bioassay) Percent Emergence Relative Seedling Vigor	 %, (average) %, (average)	 N/A N/A	TMECC 05.05-A

(d) *Biotic Soil Amendments (Hydraulically Applied*). Soil amendments shall be a combination of natural fibers, growth stimulants, and other biologically active material designed to improve seed germination and vegetation establishment as shown in Table 212-8. Biotic soil amendments shall be pre-packaged in ultraviolet and weather resistant packaging and labeled from the manufacturer. Bags (containers) which arrive at the project site opened, damaged, or lacking a label will be rejected. Bulk shipments such as tote

bags will be rejected. Biotic soil amendments shall be stored in locations not exceeding 80 °F. Acceptance of material shall be subject to the requirements of the Department's Approved Product List (APL).

The application rate of the biotic soil amendments shall be in accordance with the rates shown on the plans. Use of mulch tackifier (Plantago Insularis or pre-gelatinized corn starch polymer) shall be in accordance with Section 213. It shall be used as a wetting agent at a rate of 30 pounds per acre. Biotic soil amendments shall provide a continuous and uniform cover and shall consist of one of the components in Table 212-8 and all of the performance and physical properties in Table 212-9.

Table 212-8
Required Percentage Ranges of Biotic Soil Amendments

Components	Units	Requirement
Professional grade sphagnum peat moss, professional grade reed sedge peat moss or compost that meets the Seal of Testing Assurance Program of the US Composting Council	%, dry weight basis	> 41%
Mechanically processed straw consisting of weed free agricultural straw, flexible flax fiber or rice hulls	%, dry weight basis	< 57%

Table 212-9
Performance and Physical Requirements of Biotic Soil Amendments

Parameters	Reported as	Requirement	Test Method
pH	pH units	5.0 – 7.5	ASTM D1293
Moisture content	%, wet weight basis	10% - 50%	ASTM D 2974
Organic matter content	%, dry weight basis	> 85%	ASTM D586
Carbon Nitrogen Ratio	Ratio C:N	< 38:1	ASTM E1508
Man-made inert contamination	%, dry weight basis	< 1.0%	
Acute Toxicity	(Pass/Fail)	Pass (non-toxic)	ASTM E729-96(2014) or EPA Method 2021.0 or EPA Method 2002.0
Vegetative Minimum		> 400%	ASTM 7322
The Contractor shall provide a CTR with independent laboratory analysis for the required parameters in accordance with subsection 106.13.			

(e) *Humate*. The Contractor shall provide a screened dry granular form of organic humic and fulvic acid substance. Humate shall be pre-packaged and labeled from the manufacturer. Bags (containers) which arrive at the project site opened, damaged, or lacking label will be rejected. The Contractor shall only use bulk shipments such as tote bags or super sacks that have a manufacture's original label and sealed at the manufacturing facility. Humate shall be stored in locations not exceeding 80 °F. Humate shall be provided in accordance with the rates shown on the plans. Product shall conform to the parameters in Table 212-10 and Table 212-11.

Table 212-10
Screened Size Requirements for Humate

Seeding Method	Reported as	Requirement
Seeding (Native) Drill, Hydraulic and Broadcast	inches	< 1/4

Table 212-11
Performance and Physical Requirements of Humate

Parameters	Reported as	Requirement	Test Method
Organic Matter	%, dry weight basis	>70%	
Fines (material that is finer than the No. 200 (75-µm) sieve)	%, dry weight basis	<2%	ASTM D7928
pH	pH units	3.0 - 4.5	ASTM D1293
Acute Toxicity	Pass / Fail	Non Toxic	ASTM 7101 or EPA Method 2021 or 2002
Humic and Fulvic Acids	%, dry weight basis	> 70%	A & L Western method; total alkali extractable
Carbon Content	%, dry weight basis	40% - 50%	
Moisture Content	%, dry weight basis	< 20%	
Heavy Metal / Ash Content	%, dry weight basis	< 15%	
The Contractor shall provide a CTR with independent laboratory analysis for the required parameters in accordance with subsection 106.13.			

(f) *Mycorrhizae*. Mycorrhizae shall arrive onsite in original and undamaged packaging. Handling of this material shall follow manufacturer's safety recommendations. Mycorrhizae shall be stored onsite in such a way as to avoid exposure to direct sunlight for more than four hours and to prevent package temperatures to rise above 85 °F. The endo mycorrhizal inoculum shall provide at least 60,000 propagules per pound and shall contain all of the following species and conform to the parameters in Table 212-12:

(1) Glomus intraradices (a.k.a. Rhizophagus intraradices)

(2) Glomus mosseae (a.k.a. Funneliformis mosseae)

(3) Glomus aggregatum (a.k.a. rhizophagus aggregatus)

(4) Glomus etunicatum (a.k.a. Claroideoglomus etunicatum)

Table 212-12
Physical Requirements of Endo Mycorrhizae

Parameters	Reported as	Requirement	Test Method
Acute Toxicity	Pass or Fail	Non Toxic	ASTM 7101 or EPA Method 2021 or 2002
The Contractor shall provide a CTR with independent laboratory analysis has been done on the product for the required parameters in accordance with subsection 106.13.			

The following rates shall be used for Seeding Methods:

(1) For Seeding (Native) Drill, the mycorrhizae product shall be provided as a dry free-flowing granular material, suitable for application by agricultural drill seeder. Application rate shall be 8 pounds per acre.

(2) For Seeding (Native) Hydraulic, the mycorrhizae product shall be provided as a fine granular (< 2 mm) or powdered form (particle size less than 300 microns) that will permit complete suspension and used with hydro-seeder equipment. Application rate shall be 20 pounds per acre.

(3) For Seeding (Native) Broadcast, the mycorrhizae product shall be provided as a dry free-flowing granular material, suitable for application by fertilizer spreader. Application rate shall be 20 pounds per acre.

(g) *Elemental Sulfur.* The Contractor shall provide a free-flowing granular material consistent in size suitable for application by agricultural spreader and conform to the parameters in Table 212-13. Elemental sulfur shall arrive onsite in original and undamaged packaging.

Table 212-13
Physical Requirements of Elemental Sulfur

Parameters	Reported as	Requirement
Guaranteed Analysis of Elemental Sulfur (S)	%	> 90
Bulk Density	Lbs per cu. ft.	> 75

(h) *Sod.* Sod shall be nursery grown and 99 percent weed free. Species shall be as shown on the plans. The 1 percent allowable weeds shall not include undesirable perennial or annual grasses or plants defined as noxious by current State statute or county noxious weed list. Soil thickness of sod cuts shall not be less than ¾ inch or more than 1 inch. Sod shall be cut in uniform strips with minimum dimensions of 18 inches in width and 48 inches in length. The Contractor shall submit a sample of the sod proposed for use, which shall serve as a standard if approved. Sod furnished, whether in place or not, that is not up to the standard of the sample will be rejected. CDOT will reject all sod that was cut more than 72 hours prior to installation.

Each load of sod shall be accompanied by a certificate from the grower stating the type of sod and the date and time of cutting. The Contractor shall submit the certificate to the Engineer prior to application of the sod. Only sod that is accompanied by the certificate from the grower will be accepted and paid for.

CONSTRUCTION REQUIREMENTS

212.03 Submittals. The Contractor shall provide the name and contact information of the seeding contractor 30 days prior to start of seeding work. The Contractor shall provide two copies of items (1) - (14) listed below to the Pre-vegetation Conference in accordance with Section 207. When the Contractor provides resubmittals to meet Contract requirements, the Region or Headquarters Landscape Architect shall be copied on all correspondence.

(1) Written confirmation from the registered seed supplier, on the Contractor's letterhead, that the Contract specified seed has been secured. No substitutions of the contract specified seed will be permitted unless evidence is submitted, from one of the registered seed suppliers that the Contract specified seed is not available and will not become available during the anticipated construction period.

(2) Seed vendor's "seed dealer" endorsement.

(3) A copy of each seed species germination report of analysis that verifies the lot has been tested by a recognized laboratory for seed testing within 13 months prior to the date of seeding.

(4) A copy of each seed species purity laboratory report of analysis that verifies that the lot has been tested by a recognized laboratory for seed testing. The report shall list all identified species, seed count, and date of test.

(5) Manufacturer's documentation stating that the fertilizer meets the Contract requirements.

(6) Organic fertilizer documentation showing manufacturer and chemical analysis.

(7) Permit issued from CDPHE confirming that the vendor can produce or sell compost in accordance with House Bill (HB) 1181.

(8) Documentation from the compost manufacturer that it is a participating member of in the U.S. Composting Council's Seal of Testing Assurance Program (STA).

(9) Results of compost testing on an STA Compost Technical Data Sheet confirming all required test methods are met using the STA Program.

(10) Sample of physical compost (at least one cubic foot of material).

(11) Manufacturer's documentation confirming that biotic soil amendment meets the required physical and performance criteria based on independent testing by the manufacturer.

(12) Manufacturer's documentation confirming that humate meets the required physical and performance criteria based on independent testing by the manufacture.

(13) Manufacturer's documentation confirming that mycorrhizae meets the physical criteria based on independent testing and that the minimum required species is provided.

(14) Pictures and descriptions of seeding equipment proposed to be used on the project. Based on the seeding methods required at a minimum this should include the drill seeder, hydraulic seeder, cultipacker or seed bed roller implements.

(15) Instructions and documentation on how seeders will be calibrated onsite, in accordance with subsection 212.05(a).

212.04 Seeding Seasons. Seeding in areas that are unirrigated shall be restricted according to the parameters in Table 212-14.

Table 212-14
Seeding Seasons

Zone	Spring Seeding	Fall Seeding
Areas other than the Western Slope		
Below 6000’	Spring thaw to June 1	September 15 until consistent ground freeze
6000’ - 7000’	Spring thaw to June 1	September 1 until consistent ground freeze
7000’ - 8000’	Spring thaw to July 15	August 1 until consistent ground freeze
Above 8000’	Spring thaw to consistent ground freeze	
Western Slope		
Below 6000’	Spring thaw to May 1	August 1 until consistent ground freeze
6000’ - 7000’	Spring thaw to June 15	September 1 until consistent ground freeze
Above 7000’	Spring thaw to consistent ground freeze	

(1) "Spring thaw" is the earliest date in a new calendar year in which seed can be buried ½ inch into the surface soil (topsoil) through normal drill seeding methods.

(2) "Consistent ground freeze" is the time during the fall months in which the surface soil (topsoil), due to freeze conditions, prevents burying the seed ½ inch through normal drill seeding operations. Seed shall not be sown, drilled, or planted when the surface soil or topsoil is in a frozen or crusted state.

Seeding accomplished outside the time periods listed above will be allowed only when the Contractor's request is approved by the Engineer in writing, with coordination from the Region Landscape Architect. If requested by the Contractor, the Contractor must agree to perform the following work at no cost to the Department: reseed, remulch, and repair areas which fail to produce species indicated in the Contract.

If seeding is ordered by the Engineer outside the time periods listed above, the cost to repair areas that fail to produce species will be paid for by the Department.

212.05 Native Seeding Methods. Areas to be seeded shall be installed in accordance with SWMP Permanent Stabilization Plan.

All amendments and seeding shall be applied based on the seeding method and rates specified on the plans.

The Contractor shall complete the Amendments Verification Prerequisite for each of the seeding methods described herein. This shall be done by completing a Seed and Amendment Quantities Worksheet for each work area. This worksheet shall have a list of all amendments and the seed labels for each of the areas to be worked on. The State required legal tags shall remain on the bag until opened and the seed placed in either the drill or hydraulic seeders in the presence of the Engineer. Seeding work shall not begin until written approval of the worksheet has been received from the Engineer.

In determining the weight of seed required for each work area, the Contractor shall use the Pure Live Seed (PLS) weight shown on each bag of seed. Calculations based on net weight will not be accepted.

The Contractor shall submit a proposed Permanent Stabilization Phasing Plan to the Engineer prior to the Pre-revegetation Conference for approval showing how the SWMP Permanent Stabilization Plans will be implemented to minimize traffic loading damage to subgrade soil prepared and seeded areas. The proposed

sequencing shall consider and identify strategies and site management control measures to protect seeded areas from foot, vehicle, and other disturbances. The strategic planning of the permanent seeding and mulch shall consider all other phasing of construction activities including traffic management and utility work. Areas damaged due to the Contractor's failing to protect the seeded areas shall be repaired at no cost to the Department. Seeded areas damaged due to circumstances beyond the Contractor's control shall be repaired and reseeded as ordered. Payment for corrective work, when ordered, shall be at the Contract prices shown and in accordance with subsection 109.04.

The following seeding application methods shall not be implemented during winds which are consistently higher than 20 MPH, or when the ground is frozen, excessively wet, or otherwise untillable. The Engineer may test to see if the moisture level in the soil is acceptable to work the soil by performing a Soil Plasticity Test as described in the Construction Manual. Multiple seeding operations shall be anticipated, based on acceptable seeding conditions. The seeding methods to be implemented shall be one or more of the following, as shown on the plans:

(a) *Seeding (Native) Drill.*

(i) *Fertilizer, Compost, Humates and Elemental Sulfur.* The Contractor shall uniformly apply compost and elemental sulfur on the surface of the topsoil using an agricultural spreader at the rate of application specified on the plans. All competitive, non-native vegetation shall be uprooted and hauled offsite prior to spreading amendments. Prior to starting incorporation of compost and elemental sulfur, the Contractor shall receive written acceptance from the Engineer on the Seed and Amendment Quantities Worksheet. Verification Prerequisite for this method also requires documentation on the Permanent Stabilization SWMP Site Maps with the approved areas outlined, signed, and dated by the Engineer to track progress. If SWMP Site Maps are not included in the Contract, the Contractor shall use the Contract grading or roadway plan sheets.

Once the Quantities Verification Prerequisite is completed for an area, the Contractor shall homogenously incorporate the compost and elemental sulfur into the top 6 inches of topsoil. Tillage of the amendments shall be completed using a disc and harrow, field cultivator, vibra-shank, or other method suitable to site conditions. For small areas tillage shall be completed using rotary tillers. No measurable depth of organic amendment shall be present on the surface.

The shanks on the back of a grader or dozer shall not be used for tillage. Tillage may take multiple passes to achieve the desired harmonious incorporation. If multiple passes are required, the Contractor shall cross till the soil with the second pass occurring at a 30-degree angle to the first pass. On slope areas, all tillage shall be parallel to the contour. For project that will utilize aggregate or recycled asphalt shouldering material amendments, tillage is not required under shouldering material. Projects seeding up to the edge of pavement, tillage is not required for first 12" from the edge of pavement.

Once incorporation of compost and elemental sulfur is approved, the Contractor shall uniformly apply fertilizer and humates on the surface of the topsoil using an agricultural spreader, as shown in the Contract documents.

(ii) *Seedbed Preparation.* Amended topsoil shall be cultivated to a firm but friable seedbed using cultipacker or seed bed roller implements. Crusted hard soils shall be broken up and all areas shall be free of clods, sticks, stones, debris, concrete, and asphalt in excess of 4 inches in any dimension in accordance with Section 207. Areas shall be left in a rough and uncompacted condition with a surface variance of 2 to 4 inches.

(iii) *Seed and Mycorrhizae.* Prior to seeding, the finished grade of the soil shall be 1 inch below the top of all curbs, junction and valve boxes, walks, drives and other structures. Seeding shall be done within two

days of seedbed preparation efforts (tilling or scarifying). If a rain event occurs that compacts or erodes the seedbed prior to performing seeding, the seedbed shall be re-prepared as directed by the Engineer.

Areas shall be seeded by mechanical power drawn drills suitable for area soils, topography, and size followed by packer wheels. Mechanical power drawn drills shall have furrow openers and depth bands set to maintain a planting depth of at least ¼ inch and not more than ½ inch and shall be set to space the rows not more than 8 inches apart. Seeding equipment shall have a double disk opener, seed box agitator, and seed metering device.

The seeder shall be calibrated by collecting seed from a single drop tube in the presence of the Engineer based on the following procedure. The Contractor shall provide the tape measure, scale, collection cup, and seed bag with complete label from the supplier. The Contractor may submit an alternative method for approval at the site Pre-vegetation Conference.

(1) Measure the total width (W) of the drill seeder in feet.

(2) Count the number of drill rows (N) on the seeder.

(3) On drill seeders that the tire drives the seeding mechanism, measure the tire circumference (C) in feet.

(4) Calculate the number of rotations the tire will complete per acre using the following equation:

A = one acre or 43,560 square feet (SF)

A /W = feet (F) the drill seeder needs to travel for each acre

F/C = number of rotations (R) of the tire per acre

(5) Reduce the amount of tire rotations by one tenth.

.90R = # Tire rotations to calibrate seeder (RCS)

(6) Find the seeding rate (LBS PLS / Acre) on the Stormwater Management Plan.

(7) Using the information from the seed tag, convert the PLS seed rate to a bulk seeding rate using the following equations:

% PLS = (% purity (in decimal form) from seed label) x (% germination (in decimal form) from seed label)

(LBS PLS / Acre) from the SWMP / % PLS = Required bulk seed per acre in LBS

(8) Reduce the required bulk seed per acre based on the number of seeder tubes.

Required bulk seed per acre / N = Weight in LBS of bulk seed from one tube

(9) Reduce the required bulk seed rate from the tube by one tenth.

0.90 x Weight of bulk seed from one tube = Collected bulk seed weight (CBS) in LBS

(10) Set the drill seeder to the correct seeding rate using the manufacturer's recommendation.

(11) With the collection cup under one tube and the driving wheel jacked up, rotate the tire the RCS amount of times. Use the value stem to count the rotations.

(12) Using the scale, weigh the seed in the collection cup.

(13) Adjust the drill calibration until the weight of bulk seed in the collection cup equals the CBS in LBS.

Drill seeders shall be recalibrated every time the drill is mobilized onsite. The Contractor shall submit a written statement that the equipment is calibrated, and shall provide the correct depth based on conditions before seeding actions are initiated. The Contractor shall continuously monitor equipment to ensure that it is providing a uniform seed application.

If mycorrhizae is called for on the plans, the granules shall be included with the seed in the drill seeder such that the mycorrhizae is placed at or below the seed.

The distance between furrows produced using the drill shall not be more than 8 inches. If rows on the drill exceed 8 inches, the Contractor shall drill the areas twice (if achievable at 30-degree angles to each other) at no additional cost to the Department.

After seeding, the furrows that were created by the drill shall be maintained in place. Construction traffic, other than what is needed to mulch the areas, shall not be permitted on the areas completed.

Permanent stabilization mulching shall be accomplished within 24 hours of drill seeding.

(b) *Seeding (Native) Hydraulic.*

This method utilizes water as the carrying agent and mixes biotic soil amendments, seed, organic fertilizer, humates, mycorrhizae and elemental sulfur into a single slurry for hydraulic application. The Contractor shall furnish and place combined slurry with a hydro-seeder that will maintain a continuous agitation and apply homogenous mixture through a spray nozzle. The pump shall produce enough pressure to maintain a continuous, non-fluctuating spray that will reach the extremities of the seeding area. Water tanks shall have a means of measuring volume in the tank. Seed shall be added to the slurry onsite, no more than 60 minutes before starting application. Slurry shall be applied from a minimum of two opposing directions to achieve complete soil coverage.

The application of the single slurry shall be applied within four hours of adding Mycorrhizae.

The Contractor shall prevent seed, fertilizer, and mulch from falling or drifting onto areas occupied by rock base, rock shoulders, plant beds, or other areas where grass is detrimental. The Contractor shall remove material that falls on plants, roadways, gravel shoulders, structures, and other surfaces where material is not specified.

(i) *Seedbed Preparation*. All areas shall be loosened to at least 6 inches, leaving the surface in rough condition with a surface variance of 6 to 8 inches. On steep slopes, tillage shall be accomplished with appropriate equipment as the slope is constructed. Soil areas shall be tilled to produce loose and friable surfaces with crusted hard soils broken up. All slopes shall be free of clods, sticks, stones, debris, concrete, asphalt and all other materials in excess of 4 inches in any dimension. All competitive, non-native vegetation shall be uprooted and hauled offsite prior to spreading amendments. Under no circumstances shall the ground surface be smooth and compacted.

(ii) *Biotic Soil Amendment, Fertilizer, Humate, Mycorrhizae and Seed*. The Contractor shall assemble all materials for proposed areas to hydro-seed and review quantities with area of coverage with the Engineer as the Quantities Verification Prerequisite for this method. Prior to mixing in the tank, the Contractor shall receive written acceptance from the Engineer on the Seed and Amendment Quantities Worksheet that the correct quantities are onsite. This quantities verification prerequisite also requires documentation on the Permanent Stabilization SWMP Site Maps with the approved areas outlined, signed, and dated by the Engineer to track progress. If SWMP Site Maps were not included in the Contract, grading or roadway plan sheets shall be used. For the verification process, the Contractor shall provide the Engineer

with all documentation for materials in unopened packaging.

After the Quantities Verification Prerequisite has been approved, the hydro-seeder shall be filled with water to 1/3 of its required volume. Following this, water and biotic soil amendments shall be added to the hydro-seeder at a consistent rate. The ratio of water to Biotic Soil Amendments shall be in accordance with manufacturer's recommendations. Fertilizer, humates and mycorrhizae shall then be added until the tank has reached 3/4 of its required volume. The tank shall then be filled with water to the required volume. Uniform slurries shall be agitated or mixed for a minimum of ten minutes after all water and materials are in the tank.

Hydraulic seeding equipment shall include a pump capable of being operated at 100 gallons per minute and at 100 pounds per square inch pressure. The equipment shall have a nozzle adaptable to hydraulic seeding requirements. Storage tanks shall have a means of estimating the volume used or remaining in the tank.

Seed shall be added to the slurry onsite no more than 60 minutes before starting application. The Contractor shall increase the Seed Plan rates (LBS PLS / Acre) as shown on the plans by 1.5 times at no additional cost to the Department. The Contractor may be required to apply slurry using multiple hoses to ensure uniform application to all areas of the site. Coverage rates shall be based on the volume of material in the tank, as verified by the Engineer. Areas of lighter applications (covering more area than what is calculated) will require additional application, as directed.

An appropriate curing period shall be in accordance with manufacturer's recommendations, and shall consider forecasted weather conditions.

Permanent stabilization mulching shall be accomplished within 24 hours of hydraulic application of native seed.

(c) *Seeding (Native) Broadcast.*

This method utilizes hand equipment to broadcast spread amendments and seed over prepared seedbeds.

(i) *Fertilizing, Compost, Humate and Elemental Sulfur.* The Contractor shall uniformly apply compost and elemental sulfur on the surface of the placed topsoil using an agricultural spreader at the rate of application specified on the plans. All competitive non-native vegetation shall be uprooted and hauled offsite prior to spreading amendments. Prior to starting incorporation, the Contractor shall receive written acceptance from the Engineer on the Seed and Amendment Quantities Worksheet that the correct quantities will be applied. The Quantities Verification Prerequisite for this method also requires documentation on the Permanent Stabilization SWMP Site Maps with the approved areas outlined, signed, and dated by the Engineer to track progress. If SWMP Site Maps are not included in the Contract, the grading or roadway plan sheets shall be used.

Once the Quantities Verification Prerequisite is completed for an area, the Contractor shall homogenously incorporate the Compost into the top 6 inches of soil. Tillage of the amendments shall be completed using appropriate tools depending on the size of the area to be worked. Contractor shall use hand tillers or approved small space implements.

Once incorporation of compost and elemental sulfur is approved, the Contractor shall uniformly apply organic fertilizer and humates on the surface of the topsoil using an agricultural spreader.

(ii) *Seedbed Preparation.* Amended topsoil shall be cultivated to a firm but friable seedbed using tractor implements. Crusted hard soils shall be broken up and all areas shall be free of clods, sticks, stones, debris, concrete, and asphalt in excess of 4 inches in any dimension in accordance with Section 207. Areas shall be left in a rough condition with a surface variance of 2 to 4 inches. Under no circumstances shall the ground surface be smooth and compacted.

(iii) *Seed and Mycorrhizae.* Prior to seeding, the finished grade of the soil shall be 1 inch below the top of all curbs, junction and valve boxes, walks, drives and other structures. Seeding shall be accomplished within two days of seedbed preparation efforts (tilling or scarifying) to make additional seedbed preparation unnecessary. If a rain event occurs that compacts or erodes the seedbed prior to performing seeding, the seedbed shall be re-prepared as directed.

Areas shall be seeded by broadcast-type seeders (cyclone or approved mechanical seeders). The Contractor shall increase the Seed Plan rates (LBS PLS / Acre) as shown on the plans by 1.5 times at no additional cost to the Department.

After seeding, mycorrhizae shall be evenly hand-distributed across the area. Seed and mycorrhizae shall be covered by hand raking and covering with ¼ to ½ inch of topsoil. To ensure seeds have a firm contact with the soil the Contractor shall use a heavy roller as approved in the Site Pre-vegetation Conference. Mycorrhizae shall not be exposed to sunlight for more than four hours. Using equipment with continuous cleat tracks (cat-tracking) to cover seed is not permitted.

Permanent stabilization mulching shall be accomplished within 24 hours of broadcast seed application of native seed.

212.06 Seeding (Temporary). Areas of topsoil shall be seeded with annual grasses in accordance with SWMP Interim Site Maps or as directed by the Engineer.

Seeding may take place at any time during the year as long as the ground is not covered in snow and topsoil is not frozen. Topsoil may be placed in a stockpile or distributed on-grade after receiving subgrade soil preparation.

Interim stabilization for areas that receive temporary seeding shall be in accordance with subsection 208.04(e)2. Seed shall not be included with interim hydraulic mulch applications.

The Contractor shall wait to amend topsoil until the area is ready for permanent seeding with native seed mix shown on the SWMP. The Contractor shall use either the drill, hydraulic, or broadcast method of seeding. Seeding rates (LBS PLS / Acre) shall be increased by 1.5 times for hydraulic and broadcast methods at no additional cost to the Department.

Seed shall meet the requirements of 212.02(a) and shall be selected from Table 212-1 based on the application time.

Table 212-1
Temporary Seed Mixes

Common Name	Botanical Name	Application Time	Seeding Rates (LBS PLS / Acre)	Planting Depth (inches)
Oats	Avena sativa	October 1 - May 1	35	1 - 2
Foxtail Millet	Setaria italica	May 2 - September 30	30	1/2 - 3/4

The Contractor shall restrict motorized vehicle and foot traffic from areas that have received temporary seeding.

212.07 Seeding (Lawn). Lawn grass seeding shall be accomplished in the seeding seasons in accordance with subsection 212.03.

(a) *Fertilizing and Soil Conditioning.* The first application of fertilizer, soil conditioner, or both shall be incorporated into the soil immediately prior to seeding, and shall consist of a soil conditioner, commercial fertilizer, or both as designated in the Contract. Fertilizer called for on the plans shall be worked into the top 4 inches of soil at the rate specified in the Contract. Biological nutrient, culture, or humate based material called for on the plans shall be applied in a uniform application onto the soil service. Organic amendments shall be applied uniformly over the soil surface and incorporated into the top 6 inches of soil.

The second application of fertilizer shall consist of a fertilizer having an available nutrient analysis of 20-10-5 applied at the rate of 100 pounds per acre. It shall be uniformly broadcast over the seeded area three weeks after germination or emergence. The area shall then be thoroughly soaked with water to a depth of 1 inch.

Fertilizer shall not be applied when the application will damage the new lawn.

(b) *Seedbed Preparation.* In preparation of seeding lawn grass, irregularities in the ground surface, except the saucers for trees and shrubs, shall be removed. Measures shall be taken to prevent the formation of low places and pockets where water will stand.

Immediately prior to seeding, the ground surface shall be tilled or hand worked into an even and loose seedbed to a depth of 6 inches, free of clods, sticks, stones, debris, concrete, and asphalt in excess of 2 inches in any dimension, and brought to the desired line and grade.

(c) *Seeding.* Seed shall be drilled with mechanical landscape type drills. Broadcast type seeders or hydraulic seeding will be permitted only on small areas not accessible to drills. Seed shall not be drilled or broadcast during windy weather or when the ground is frozen or untillable.

212.08 Sodding.

(a) *Fertilizing and Soil Conditioning*. Prior to laying sod, the 4 inches of subsoil underlying the sod shall be treated by tilling in fertilizer, compost, or humates as specified on the plans. Amendments shall be applied uniformly over the soil surface and incorporated into the top 6 inches of soil.

After laying the sod, it shall be fertilized with a fertilizer having a nutrient analysis of 20-10-5 at the rate of 200 pounds per acre. Fertilizer shall not be applied when the application will damage the sod.

(b) *Soil Preparation.* Prior to sodding, the ground shall be tilled or hand worked into an even and loose sod bed to a depth of 6 inches, and irregularities in the ground surface shall be removed. Sticks, stones, debris, clods, asphalt, concrete, and other material more than 2 inches in any dimension shall be removed. Depressions or variances from a smooth grade shall be corrected. Areas to be sodded shall be smooth before sodding occurs.

(c) *Sodding.* Sod shall be placed by staggering joints with all edges touching. On slopes, the sod shall run approximately parallel to the slope contours. Where the sod abuts a drop inlet, the subgrade shall be adjusted so that the sod shall be 1-½ inches below the top of the inlet.

Within one hour after the sod is placed and fertilized it shall be watered. After watering, the sod shall be permitted to dry to the point where it is still wet enough for effective rolling. The Contractor shall roll the sod in two directions with a lawn roller capable of applying between 50 - 80 pounds per square inch of surface pressure to eliminate air pockets.

METHOD OF MEASUREMENT

212.09 The quantities of lawn seeding and the three native seeding types will not be measured but shall be the quantities designated in the Contract, 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 designated in the Contract.

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

Organic Fertilizer, Compost (Mechanically Applied), Humates, Mycorrhizae soil amendments for Seeding (Native) methods drill, hydraulic, and broadcast will be measured by the actual quantity of material applied and accepted.

Measurement for acres will be by slope distances.

BASIS OF PAYMENT

212.10 The accepted quantities of lawn seeding, native seeding, soil conditioning, 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. Rejected seed that has been stored longer than 30 days shall be re-ordered at the expense of the Contractor.

Payment will be made under:

Pay Item	Pay Unit
Organic Fertilizer	Pound
Compost (Mechanically Applied)	Cubic Yard
Biotic Soil Amendments (Hydraulic Applied)	Pound
Humate	Pound
Mycorrhizae	Pound
Elemental Sulfur	Pound
Seeding (Native) Drill	Acre
Seeding (Native) Hydraulic	Acre
Seeding (Native) Broadcast	Acre
Seeding (Wetland) Drill	Acre
Seeding (Wetland) Hydraulic	Acre
Seeding (Wetland) Broadcast	Acre
Seeding (Temporary)	Acre
Seeding (Lawn)	Acre
Sod	Square Foot

Topsoil preparation including incorporating and applying amendments, seedbed preparation, water, and seed mix (LBS PLS / Acre) will not be measured and paid for separately but shall be included in the work.

Calibrating, adjusting, or readjusting seeding or fertilizing equipment will not be measured and paid for separately but shall be included in the work.

No additional cost will be accepted for approved substitution of specified seed mix.

No payment will be made for areas seeded using one of the seeding methods without receiving signed Seed and Amendment Quantities Worksheet from the Engineer.

Additional seedbed preparation prior to seeding to correct compaction or erosion from storm events will not be measured and paid for separately but shall be included in the work.

Additional mobilizations as needed to complete seeding within allowed seeding seasons will not be measured and paid for separately but shall be included in the work.

Removal of all competitive, non-native vegetation prior to spreading amendments will not be measured and paid for separately but shall be included in the work.

Section 601 of the Standard Specifications is hereby revised for this project to include the following:

Add the following to Table 601-1:

Concrete Class	Required Field Compressive Strength (psi)	Air Content: % Range (Total)	Slump	Maximum Water/Cementitious Material Ratio:
DF	4500 at 28 days	4 - 8	+/- 2" of Form 1373 Slump	w/cm on Form 1373

Add the following to subsection 601.02:

Class DF concrete is a macro fiber-reinforced concrete. Additional requirements are:

(1) The concrete mix shall include approved macro or hybrid polyolefin fibers at a minimum dosage of 4 lb/cy or the minimum dosage specified on the Department's Approved Product List (APL), whichever is greater.

(2) The unrestrained shrinkage shall not exceed 0.050 percent at 28 days when tested by CP-L 4103.

(3) The mix shall either have a permeability not exceeding 2,500 coulombs at an age of not more than 56 days when tested per ASTM C1202 or have a surface resistivity of at least 12 kΩ-cm at 28 days using AASHTO T358.

(4) The mix may use an OG with a nominal maximum aggregate size of at least 3/4 inch.

(5) The mix shall have a nominal maximum aggregate size of at least 3/4 inch if an OG is not used.

(6) When used in slip forming, an edge slump less than 6 mm (0.25 in.) and less than 30 percent surface voids (ranking of 2 or less) is required. The box test is described in CP 63.

(7) Shrinkage reducing admixtures may be incorporated into the mix.

(8) An expansive cement additive may be added to an ASTM C150 Type I/II cement and fly ash to produce an ASTM C845 Type K cement. The proportion of the expansive cement additive will be determined by testing the cementitious material blend per ASTM C806. The blended material shall have an expansion of 0.04 to 0.10 percent at 7 days when tested per ASTM C806. When an expansive cement is used, the w/cm ratio shall be 0.45 to 0.55 and the expansion of the laboratory trial mix shall be 0.05 to 0.09 percent at 7 days when tested per ASTM C878.

Revise Section 601 of the Standard Specifications for this project as follows:

Revise Subsection 601.05, second paragraph as follows:

(11) For air entrained concrete, report the SAM number according to AASHTO TP118 Characterization of the Air-Void System of Freshly Mixed Concrete by the Sequential Pressure Method (Super Air Meter). The SAM meter readings for each step shall be included. Perform a SAM leak test prior to the SAM testing. Results of the leak test shall be included in the SAM data.

Revise Section 630 of the Standard Specifications as follows:

Add the following to Subsection 630.11:

The traffic control diary requires a signature of the Traffic Control Supervisor.

Traffic Control Supervisors are required to always have in-use Methods of Handling Traffic available on a project.
630.11 (5, iv)

630.11 (5, iv)

Traffic Control Supervisor's name

630.11 (8)
Overseeing all requirements covered by the Contract that contribute to the convenience, safety and orderly movement of traffic. Have an up-to-date copy of the MUTCD and applicable standards and specifications available at all times on the project.

Traffic Control Supervisor's name and signature

630.11 (8)

Overseeing all requirements covered by the Contract that contribute to the convenience, safety and orderly movement of traffic. Have an up-to-date copy of the MUTCD, in-use MHTs, and applicable standards and specifications available at all times on the project.

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, Moffat, 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			

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 form 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 Par 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. STANDARD FEDERAL EQUAL EMPLOYMENT OPPORTUNITY CONSTRUCTION CONTRACT SPECIFICATIONS

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 Hometown Plan. Each Contractor or Subcontractor participating in an approved Plan 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 it has employees. The overall good faith performance by other Contractors or Subcontractor 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 he 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 compiled 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 thought 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 penalties 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 Grant Program).

C. SPECIFIC EQUAL EMPLOYMENT OPPORTUNITY RESPONSIBILITIES.

1. *General.*

   a. Equal employment opportunity requirements not to discriminate and to take affirmative action to assure equal employment opportunity as required by Executive Order 11246 and Executive Order 11375 are set forth in Required Contract. Provisions (Form FHWA 1273 or 1316, as appropriate) and these Special Provisions which are imposed pursuant to Section 140 of Title 23, U.S.C., as established by Section 22 of the Federal-Aid highway Act of 1968. The requirements set forth in these Special Provisions shall constitute the specific affirmative action requirements for project activities under this contract and supplement the equal employment opportunity requirements set forth in the Required Contract provisions.

   b. The Contractor will work with the State highway agencies and the Federal Government in carrying out equal employment opportunity obligations and in their review of his/her activities under the contract.

   c. The Contractor and all his/her subcontractors holding subcontracts not including material suppliers, of $10,000 or more, will comply with the following minimum specific requirement activities of equal employment opportunity: (The equal employment opportunity requirements of Executive Order 11246, as set forth in Volume 6, Chapter 4, Section 1, Subsection 1 of the Federal-Aid Highway Program Manual, are applicable to material suppliers as well as contractors and subcontractors.) The Contractor will include these requirements in every subcontract of $10,000 or more with such modification of language as is necessary to make them binding on the subcontractor.

2. *Equal Employment Opportunity Policy*. The Contractor will accept as his operating policy the following statement which is designed to further the provision of equal employment opportunity to all persons without regard to their race, color, religion, sex, or national origin, and to promote the full realization of equal employment opportunity through a positive continuing program;

   It is the policy of this Company to assure that applicants are employed, and that employees are treated during employment, without regard to their race, religion, sex, color, or national origin. Such action shall include; employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship, preapprenticeship, and/or on-the-job training.

3. *Equal Employment Opportunity Officer*. The Contractor will designate and make known to the State highway agency contracting officers and equal employment opportunity officer (herein after referred to as the EEO Officer) who will have the responsibility for an must be capable of effectively administering and promoting an active contractor program of equal employment opportunity and who must be assigned adequate authority and responsibility to do so.

4. *Dissemination of Policy*.

   a. All members of the Contractor's staff who are authorized to hire, supervise, promote, and discharge employees, or who recommend such action, or who are substantially involved in such action, will be made fully cognizant of, and will implement, the Contractor's equal employment opportunity policy and contractual responsibilities to provide equal employment opportunity in each grade and classification of employment. To ensure that the above agreement will be met, the following actions will be taken as a minimum;

      (1) Periodic meetings of supervisory and personnel office employees will be conducted before the start of work and then not less often than once every six months, at which time the Contractor's equal employment opportunity policy and its implementation will be reviewed and explained. The meetings will be conducted by the EEO Officer or other knowledgeable company official.

(2) All new supervisory or personnel office employees will be given a thorough indoctrination by the EEO Officer or other knowledgeable company official, covering all major aspects of the Contractor's equal employment opportunity obligations within thirty days following their reporting for duty with the Contractor.

(3) All personnel who are engaged in direct recruitment for the project will be instructed by the EEO Officer or appropriate company official in the Contractor's procedures for locating and hiring minority group employees.

b. In order to make the Contractor's equal employment opportunity policy known to all employees, prospective employees and potential sources of employees, i.e., schools, employment agencies, labor unions (where appropriate), college placement officers, etc., the Contractor will take the following actions:

(1) Notices and posters setting forth the Contractor's equal employment opportunity policy will be placed in areas readily accessible to employees, applicants for employment and potential employees.

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(2) The Contractor's equal employment opportunity policy and the procedures to implement such policy will be brought to the attention of employees by means of meetings, employee handbooks, or other appropriate means.

5. *Recruitment*.

a. When advertising for employees, the Contractor will include in all advertisements for employees the notation; "An Equal Opportunity Employer." All such advertisements will be published in newspapers or other publications having a large circulation among minority groups in the area from which the project work force would normally be derived.

b. The Contractor will, unless precluded by a valid bargaining agreement, conduct systematic and direct recruitment through public and private employee referral sources likely to yield qualified minority group applicants, including, but not limited to, State employment agencies, schools, colleges and minority group organizations. To meet this requirement, the Contractor will, through his EEO Officer, identify sources of potential minority group employees, and establish with such identified sources procedures whereby minority group applicants may be referred to the Contractor for employment consideration.

In the event the Contractor has a valid bargaining agreement providing for exclusive hiring hall referrals, he is expected to observe the provisions of that agreement to the extent that the system permits the Contractor's compliance with equal employment opportunity contract provisions. (The U.S. Department of Labor has held that where implementation of such agreements have the effect of discriminating against minorities or women, or obligates the Contractor to do the same, such implementation violates Executive Order 11246, as amended.)

c. The Contractor will encourage his present employees to refer minority group applicants for employment by posting appropriate notices or bulletins in areas accessible to all such employees. In addition, information and procedures with regard to referring minority group applicants will be discussed with employees.

`6. *Personnel Actions*. Wages, working conditions, and employee benefits shall be established and administered, and personnel actions of every type, including hiring, upgrading, promotion, transfer, demotion, layoff, and termination, shall be taken without regard to race, color, religion, sex, or national origin. The following procedures shall be followed;

a. The Contractor will conduct periodic inspections of project sites to insure that working conditions and employee facilities do not indicate discriminatory treatment of project site personnel.

b. The Contractor will periodically evaluate the spread of wages paid within each classification to determine any evidence of discriminatory wage practices.

c. The Contractor will periodically review selected personnel actions in depth to determine whether there is evidence of discrimination. Where evidence is found, the Contractor will promptly take corrective action. If the review indicates that the discrimination may extend beyond the actions reviewed, such corrective action shall include all affected persons.

d. The Contract will promptly investigate all complaints of alleged discrimination made to the Contractor in connection with his obligations under this contract, will attempt to resolve such complaints, and will take appropriate corrective action within a reasonable time. If the investigation indicates that the discrimination may affect persons other than the complainant, such corrective action shall include such other persons. Upon completion of each investigation, the Contractor will inform every complainant of all of his avenues of appeal.

7. *Training and Promotion*.

a. The Contractor will assist in locating, qualifying, and increasing the skills of minority group and women employees, and applicants for employment.

b. Consistent with the Contractor's work force requirements and as permissible under Federal and State regulations, the Contractor shall make full use of training programs, i.e., apprenticeship, and on-the-job training programs for the geographical area of contract performance. Where feasible, 25 percent of apprentices or trainees in each occupation shall be in their first year of apprenticeship or training.

c. The Contractor will advise employees and applicants for employment of available training programs and entrance requirements for each.

d. The Contractor will periodically review the training and promotion potential of minority group and women employees and will encourage eligible employees to apply for such training and promotion.

8. *Unions*. If the Contractor relies in whole or in part upon unions as a source of employees, the Contractor will use his/her best efforts to obtain the cooperation of such unions to increase opportunities for minority groups and women with the unions, and to effect referrals by such unions of minority and female employees. Actions by the Contractor either directly or thorough a contractor's association acting as agent will include the procedures set forth below:

a. The Contractor will use best efforts to develop, in cooperation with the unions, joint training programs aimed toward qualifying more minority group members and women for membership in the unions and increasing the skills of minority group employees and women so that they may qualify for higher paying employment.

b. The Contractor will use best efforts to incorporate an equal employment opportunity clause into each union agreement to the end that such union will be contractually bound to refer applicants without regard to their race, color, religion, sex, or national origin.

c. The Contractor is to obtain information as to the referral practices and policies of the labor union except that to the extent such information is within the exclusive possession of the labor union and such labor union refuses to furnish such information to the Contractor, the Contractor shall so certify to the State highway department and shall set forth what efforts have been made to obtain such information.

d. In the event the union is unable to provide the Contractor with a reasonable flow of minority and women referrals within he time limit set forth in the collective bargaining agreement, the Contractor will, through independent recruitment efforts, fill the employment vacancies without regard to race, color, religion , sex or national origin; making full efforts to obtain qualified and/or qualifiable minority group persons and women. (The U.S. Department of Labor has held that it shall be no excuse that the union with which the Contractor has a collective bargaining agreement providing for exclusive referral failed to refer minority employees.) In the event the union referral practice prevents the Contractor from meeting the obligations pursuant to Executive Order 11246, as amended, and these special provisions, such Contractor shall immediately notify the State highway agency.

9. *Subcontracting*.

a. The Contractor will use his best efforts to solicit bids from and to utilize minority group subcontractors or subcontractors with meaningful minority group and female representation among their employees. Contractors shall obtain lists of minority-owned construction firms from State highway agency personnel.

b. The Contractor will use his best efforts to ensure subcontractor compliance with their equal employment opportunity obligations.

10. *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 State highway agency and the Federal Highway Administration.

c. The Contractors will submit an annual report to the State highway agency 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.