COLORADO DEPARTMENT OF TRANSPORTATION
SPECIAL PROVISIONS

The 2021 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. When specifications or special provisions contain both English units and SI units, the English units apply and are the specification requirement.

PROJECT SPECIAL PROVISIONS

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COLORADO DEPARTMENT OF TRANSPORTATION
SPECIAL PROVISIONS
I-70 & SH 79 INTERCHANGE
STANDARD SPECIAL PROVISIONS

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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 Town representative. Prospective bidders shall contact one of the following listed authorized Town representatives at least 12 hours in advance of the time they wish to go over the project.

Town of Bennett Project Manager -	Daymon Johnson	
	Office Phone:	(303) 644-3249 ext. 1005
Project Engineer -	Dan Giroux	
	Office Phone:	(303) 644-3249

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

Questions received from bidders along with Town of Bennett responses will be emailed to and from the Town of Bennett Project Manager below as they become available.

djohnson@bennett.co.us

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

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

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

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

COMMENCEMENT AND COMPLETION OF WORK

The Contractor shall commence work under the Contract on or before the 5th day following Contract execution or the 20th 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 **80 Working Days,** in accordance with the "Notice to Proceed."

CONTRACT GOAL (COMBINED)

The Department has determined that Underutilized Disadvantaged Business Enterprises (UDBEs) will participate by contracting for a part of the work of this Contract. The contract goal for participation in this Contract by certified DBEs who have been determined to be underutilized has been established as follows:

UDBE* 15 Percent

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

$$\text{Percentage} = 100 \times \frac{\text{**Dollar amount of work to be contracted to underutilized DBEs (UDBEs)}}{\text{Total dollar amount of the original Contract}}$$

* All DBEs will be considered to be UDBEs.
** Based on DBE contract unit prices rather than prime contract unit prices.

NOTE: Specific Good Faith Efforts required to meet the Contract Goal specified above are defined in the Standard Special Provisions. In addition, the Transportation Commission has determined an overall 12.69% annual goal for the participation of all DBEs.

ON THE JOB TRAINING CONTRACT GOAL

The Department has determined that On the Job Training shall be provided to trainees with the goal of developing full journey workers in the types of trade or classification involved. The contract goal for On the Job Trainees working in an approved training plan in this Contract has been established as follows:

Minimum number of total On the Job Training required **200** hours

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:

After the proposals have been opened, the low responsible bidder may obtain an electronic sets of plans and special provisions from the Town of Bennett.

Also, if they are available for the project, the low responsible bidder may also obtain cross sections, major structure plan sheets, and computer output data.

REVISION OF SECTION 105
COOPERATION BETWEEN CONTRACTORS

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

Subsection 105.07 shall include the following:

Other contractors will be working within or near the project limits. The Contractor for this project shall coordinate the work with these contractors as required, insuring an orderly completion of work. The Contractor shall contact all contractors working within the project limits, and assign contact personnel between them. The Contractor shall notify the Engineer in writing of these contacts and of what arrangements have been made.

Including but not limited to the following projects:

- SH 79 & Marketplace Drive Intersection Improvements Project

REVISION OF SECTION 105
CONTROL OF WORK

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

In Subsection 105.20 delete the second paragraph and replace with the following:

The Contractor shall provide timely response and complete all Traffic Signal Maintenance for traffic signals that are included in the contract work within the project limits. The Contractor shall respond to the project site within one hour of notification for urban highway projects, and within four hours of notification for rural highway projects. These services shall be available upon notice and provided at all times, including holidays and seasonal no-work periods. The Contractor shall provide these services beginning when time count starts for the project through final acceptance. The Contractor shall submit a Traffic Signal Maintenance Plan (TSMP) to the Engineer for acceptance at the Pre-Construction Conference. The TSMP shall include the following:

(a) *Contact Information*. The Contractor shall designate a single contact person to be responsible for coordination and execution of the project TSMP. TSMP shall contain the Contractor's TSMP coordinator's contact information, including name and phone number, and additional contact information for all personnel assigned to perform Traffic Signal Maintenance.

(b) *Plan Requirements*. The TSMP shall establish a specific communications process to coordinate and manage Traffic Signal Maintenance. The TSMP shall document the project's response time to confirm the requirements stated above. The TSMP coordinator shall be responsible for all communications during an incident, including notification of the Engineer, and communications with concerned stakeholders regarding when the maintenance operations are started, the estimated time frame of the repair or maintenance, the time repair has been completed, and the time normal traffic operations are resumed. A post-incident evaluation report shall be submitted to the Engineer within 48 hours of the initial incident notification. The report shall summarize the incident timeline, the repair and maintenance required, and the communication efforts made during the incident.

(c) *Certification Documentation*. The Contractor shall adhere to the following requirements regarding Traffic Signal construction and maintenance personnel certifications. Current Certificates showing qualifications shall be documented in the TSMP to be submitted at the Pre-Construction Conference.

(1) A licensed Journeyman Electrician shall be on site at all times that signalization work is taking place to ensure proper construction. This shall include conduit and caisson installation.

(2) For work inside the traffic signal cabinet, Signal and Signal Bench Technicians shall be minimum International Municipal Signal Association (IMSA) Level II certified. This includes the completion of training in construction, corrective maintenance, and signal turn-on.

(3) For all work external to the signal cabinet, a minimum IMSA Level I Traffic Signal Field Technician/Electrician, or Traffic Signal Bench Technician/Signal Technician, is required. A Journeyman Electrician and an IMSA Level II Traffic Signal Electrician shall be on the job site at all times that signalization work is taking place to ensure proper construction. For each Journeyman Electrician present, a maximum of 3 Apprentice Electricians will be allowed for work.

(d) *Traffic Control*. The Contractor shall perform traffic control as required until completion of the TSMP. All required traffic control contact information shall be provided in the TSMP.

The Contractor shall complete Traffic Signal Maintenance in accordance with the TSMP and all other applicable project standard specifications or special provisions.

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REVISION OF SECTION 105
CONTROL OF WORK

Traffic Signal Maintenance as described above will not be measured and paid for separately, but shall be included in the work.

REVISION OF SECTION 106
CONFORMITY TO THE CONTRACT OF HOT MIX ASPHALT

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

Subsection 106.05 shall include the following:

For this project, Contractor process control testing of hot mix asphalt is mandatory.

REVISION OF SECTION 107
PERFORMANCE OF SAFETY CRITICAL WORK

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

Subsection 107.061 is hereby added to this project as follows:

107.061 Performance of Safety Critical Work. The following work elements are considered safety critical work for this project:

(1) Overhead structure construction or repair (signal installation)
(2) Work requiring the use of cranes or other heavy lifting equipment to set girders, sound walls, make overhead repairs; also when construction materials are being lifted that may fall onto active traffic lanes.
(3) Caissons and/or directional boring in high density utility corridor.

The Contractor shall submit, for review, an initial, detailed construction plan that addresses safe construction methods for each of the safety critical elements applicable to this project. The Engineer will submit the plans to CDOT Staff Bridge for a concurrent review. The Engineer's review will be for general conformance with the plans, specifications, best management practices regarding safety of the operation and industry standards. When the specifications already require an erection plan, a bridge removal plan, or a removal of portion of bridge plan, it shall be included as a part of this plan. The detailed construction plan shall be submitted two weeks prior to the safety critical element conference described below. The construction plan shall be stamped "Approved for Construction" and signed by the Contractor. The construction plan will be reviewed for acceptance by the Engineer.

The Construction Plan shall include the following:

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

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

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

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

(5) Underground, above grade, and overhead utilities identification and protective steps taken.

(6) Communication plan as necessary with stakeholders, media, and the public.

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

(8) Names and qualifications of workers who will be in responsible charge of the work:
A. Years of experience performing similar work
B. Training taken in performing similar work
C. Certifications earned in performing similar work

(9) Names and qualifications of workers operating cranes or other lifting equipment
A. Years of experience performing similar work
B. Training taken in performing similar work
C. Certifications earned in performing similar work

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REVISION OF SECTION 107
PERFORMANCE OF SAFETY CRITICAL WORK

(10) The construction plan shall address how the Contractor will handle contingencies such as:
A. Unplanned events (storms, traffic accidents, work accidents, etc.)
B. Structural elements that don't fit or line up
C. Work that cannot be completed in time for the roadway to be reopened to traffic
D. Replacement of workers who don't perform the work safely
E. Unexpected absence of critical management team
F. Equipment failure
G. Other potential difficulties inherent in the type of work being performed

(11) Name and qualifications of Contractor's person designated to determine and notify the Engineer in writing when it is safe to open a route to traffic after it has been closed for safety critical work.

(12) Erection plan or bridge removal plan when submitted as required elsewhere by the specifications. Plan requirements that overlap with above requirements may be submitted only once.

A safety critical element conference shall be held two weeks prior to beginning construction on each safety critical element. The Engineer, the Contractor, the safety critical element subcontractors, and the Contractor's Engineer shall attend the conference. Required pre-erection conferences or bridge removal conferences may be included as a part of this conference. Communications staff (Contractor or CDOT) shall also attend in order to address any public/media needs.

After the safety critical element conference, and prior to beginning work on the safety critical element, the Contractor shall submit a final construction plan to the Engineer for record purposes only. The final construction plan shall be stamped "Approved for Construction" and signed by the Contractor.

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

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

When ordered by the Engineer, the Contractor shall remove workers from the project that are performing the safety critical work in a manner that creates an unsafe situation for the public in accordance with subsection 108.06.

Should an unplanned event occur or the safety critical operation deviate from the submitted plan, the Contractor shall immediately cease operations on the safety critical element, except for performing any work necessary to ensure worksite safety, and provide proper protection of the work and the traveling public. If the Contractor intends to modify the submitted plan, he shall submit a revised plan to the Engineer prior to resuming operations.

All costs associated with the preparation and implementation of each safety critical element construction plan will not be measured and paid for separately, but shall be included in the work.

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REVISION OF SECTION 107
PERFORMANCE OF SAFETY CRITICAL WORK

The Contractor shall not be relieved from ultimate liability for unsafe or negligent acts or receive a waiver of the Colorado Governmental Immunity Act on behalf of the Department.

REVISION OF SECTION 107
PROTECTION OF EXISTING VEGETATION

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

Subsection 107.12 shall include the following:

The Contractor shall save all existing vegetation (including trees, shrubs, ground covers, grasses, wetlands & riparian) in this area, except for that vegetation, which must be removed to accommodate construction of the project, per the plans. Specific areas of vegetation to be protected shall be as directed by the Engineer and shall be protected by using fencing (plastic). Fencing for trees shall be installed at the drip line of the tree or as approved by the Engineer. Equipment shall not be installed or stockpile material within 15 feet of existing trees to remain.

The Contractor shall perform all the work in such a manner that the least environmental damage will result. All questionable areas or items shall be brought to the attention of the Engineer for approval prior to removal or any damaging activity.

The Contractor shall promptly report any vegetation damaged or scarred during construction to the Engineer for assessment of damages. Damaged or destroyed fenced vegetation, shall be replaced at the expense of the Contractor. Vegetation of replaceable size shall be replaced at the Contractor's expense. When trees, shrubs beyond replaceable size or wetlands have been damaged or destroyed, the Contractor shall be liable for the appraised value based upon the official current publications. For trees and shrubs use the International Society of Arboriculture, Guide for Plant Appraisals. The value of disturbed vegetation shall be calculated according to the following formula:

(Vegetation size) x (Species) x (Location) x (Condition) x (Arborist or Wetland Specialist) = Vegetation value

A consulting Arborist retained by the Department will determine the value of the trees and shrubs. A consulting Wetland Specialist shall determine the value of the wetland or wetland species. This value will be deducted from any money due to the Contractor.

The determination as to whether a plant is of replacement size or beyond will be made by the Department's Landscape Architect or Wetland Specialist.

If any fence is knocked down or destroyed by the Contractor, the Engineer will suspend the work, wholly or in part, until the fence is repaired to the Engineer's satisfaction 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.

REVISION OF SECTION 107
CONSTRUCTION NOISE AND NIGHT WORK

Revise Section 107 of the Standard Specifications for this project to include the following:

The Contractor shall comply with all State and local regulatory requirements regarding noise created by night work, specifically, any work that generates noise in excess of regulatory limits prescribed in CRS 25-12-103(1) between the hours of 7:00 p.m. and 7:00 a.m., or as defined by local regulations and ordinances, whichever is more stringent.

The Contractor shall research and comply with all Town of Bennett noise ordinances and any other restrictions applicable to nighttime construction activities. The Contractor shall coordinate with the Town and the Engineer for any noise exemption, variance, or approval as required.

All requests for a noise variance and/or Engineer's approval of night work shall be submitted a minimum of 30 days prior to commencement of the work, and shall include the following information:

1. Requesting entity
2. Contact person and phone number
3. Specific location of the work
4. Types of activities to occur
5. Reason variance is being requested
6. Equipment proposed to be used
7. Start, end dates, and hours of proposed night work
8. Total number of nights of work

The Contractor shall submit any noise exemption request to the Engineer for approval prior to sending to the jurisdictional authority Nighttime construction activities with the potential to exceed applicable noise-level restrictions cannot begin until the jurisdictional authority and the Engineer have approved all required documentation and notifications.

Exemption requests, permitting requirements and other requirements of this specification will not be paid for separately but shall be included in the work.

REVISION OF SECTION 202
CLEAN CULVERT

Revise Section 202 of the Standard Specifications for this project as follows:

Subsection 202.01 shall include the following:

This work consists of cleaning, removing, and disposing of sediment and other debris in the storm drain inlets and culverts at locations shown on the plans.

Subsection 202.10 shall include the following:

Before cleaning operations, remove and store all grates and other appurtenances from the inlet or culvert pipe.

Perform culvert cleaning using a vacuum truck method as approved. Use a high-pressure washer to strip off all soil sediment and other debris accumulated on the structure's walls. Suction the mix of water and debris out of the structure and into the vacuum truck. Dispose of removed material at a suitable facility located off the project site per applicable regulations and guidelines. The remaining material left in the structure after cleaning shall be removed at the Contractor's expense. Document and provide in writing the total amount of material removed.

Replace all damaged or missing bolts for the grates and other appurtenances. Upon completing cleaning, treat existing and new bolts required for the grates and other appurtenances with anti-seize compound. Then, reinstall the grate and appurtenances using the treated bolts.

If debris accumulates in clean structures during construction, reclean structures at the Contractor's expense.

Subsection 202.11 shall include the following:

Measure Clean Culvert by the actual number of existing culvert pipes and inlets that are cleaned and accepted. Cleaning of drainage pipe between inlets, barrier drain holes, and flaps, when required, will not be measured or paid for separately; include it in the work price.

Subsection 202.12 shall include the following:

Pay under:

Pay Item	**Pay Unit**
Clean Culvert	Each

Payment will consist of full compensation for all labor, materials, and equipment required to clean, maintain, remove, and dispose of sediment and other debris from storm drain inlets and culverts prior to construction.

The amount of anti-seize compound and new bolts required will not be measured and paid for separately; include it in the work price.

The quantity of debris and water disposal will not be measured and paid for separately; include it in the work price.

The amount of water required for pressure washing will not be measured and paid for separately; include it in the work price.

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:

The upper 2 feet of embankment material below the subgrade elevation shall have a resistance value of at least 19 when tested by the Hveem Stabilometer or the equivalent resilient modulus.

Subsection 203.12 shall include the following:

Embankment Material will not be measured and paid separately, but shall be included in the cost of Unclassified Excavation (Complete in Place).

REVISION OF SECTION 210
MODIFY INLET

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

Subsection 210.10 shall include the following:

Modifying structure shall include, but not be limited to, partial reconstruction of the structure by:

1. Increasing the number of pipes entering the structure.
2. Removing a portion of the existing structure, including the existing inlet grate
3. Adding a new portion of the structure to match the proposed grade.
4. Adding a new ring and manhole cover.

Structure excavation or backfill, reinforcing steel, concrete or any other material required to modify the structure as indicated on the plans shall not be paid for separately, but shall be included in the work.

REVISION OF SECTION 210
RESET ROAD CLOSURE GATE

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

Subsection 210.13 shall include the following:

Payment will be made under:

Pay Item	**Pay Unit**
Reset Gate	EA

Payment for Reset Gate shall be full compensation for all work necessary to complete this item, including but not limited to removal of road closure gate during grading operations, storing, and protecting, installing new foundations, and resetting once paving operations are completed.

REVISION OF SECTION 217
HERBICIDE TREATMENT

Section 217 of the Standard Specifications is hereby revised for the project as follows:

DESCRIPTION

Delete Subsection 217.01 and replace with the following:

All areas to be disturbed within the project area, regardless of final disposition, shall be treated with herbicide before disturbance. After seeding and near the end of the project, if noxious weed species persist, seeded areas shall receive an additional application of herbicide. All applications shall target noxious weeds designated by the Colorado Department of Agriculture including List A, B, and C species. Recommended treatments for noxious weeds identified in the project area are summarized in the following table. Additional recommended treatments for noxious weeds including those not listed in the table below, can be found on the Colorado Department of Agriculture's website at https://www.colorado.gov/pacific/agconservation/noxious-weed-species

Noxious Weed	Plant Growth Characteristics	State List[1]	Recommended Treatments
Canada thistle (*Cirsium arvense*)	Aggressive rhizomatous perennial of moist/wet sites; seeds and plant parts easily transported by construction equipment.	B	**Mechanical Control**: Due to the species' extensive root system, hand-pulling and tilling stimulate the growth of new plants and are not recommended. Mowing every 10 to 21 days during the growing season can be effective. **Herbicide Control**: Aminopyralid (Milestone), Clopyralid + Triclopyr, Amiocyclopyracholor + chlorosulfur, or Picloram applied in spring before flowering and/or during fall regrowth. **Cultural Control**: Reseed with native seed mix and prevent bare ground.
Cheatgrass (*Bromus tectorum*)	Prolific seed producing winter annual; becomes a fire hazard upon maturity. Seeds easily transported by construction equipment.	C	**Mechanical Control:** Mowing and chopping is not recommended. **Herbicide Control:** Fall application of Plateau, prior to hard freeze is optimum. Can also make application during early spring growth. Or, apply Panoramic 2 SL pre-or post emergent in later summer or early fall. **Cultural Control:** Reseed with native seed mix. Check seed mix for cheatgrass contaminant.
Field bindweed (*Convolvulus arvensis*)	Long-lived perennial; Construction could increase the plants abundance due to its ability to spread rapidly on disturbed sites and to grow from root fragments.	C	**Mechanical Control**: Cutting, mowing, or pulling is generally not effective. **Herbicide Control**: Clarity + 2,4-D Amine or Roundup Ultra applied at full-bloom and/or fall. **Cultural Control**: Reseed with native seed mix.

[1]**List A** Species in Colorado that are designated by the Commissioner for eradication.

List B Species are species for which the Commissioner, in consultation with the state noxious weed advisory committee, local governments, and other interested parties, develops and implements state noxious weed management plans designed to stop the continued spread of these species.
List C Species are species for which the Commissioner, in consultation with the state noxious weed advisory committee, local governments, and other interested parties, will develop and implement state noxious weed management plans designed to support the efforts of local governing bodies to facilitate more effective integrated weed management on private and public lands.

Dicamba may injure woody plants.
Glyphosate may be used in riparian areas
2,4-D and Transline should not be used in riparian areas or near water.
Picloram is persistent in the soil and should not be used in areas to be re-seeded.

CONSTRUCTION REQUIREMENTS

Section 217.03 shall include the following:

The Contractor shall comply with the following best management practices in all construction areas to prevent the spread of noxious weeds and minimize potential effects from treatment:

• Minimization of soil disturbance to the greatest extent possible

• Clean all construction-related equipment thoroughly before off-loading at the project site and after working with weed-contaminated soils

• Coordination of weed management efforts with adjacent landowners to the extent possible

• Avoidance of non-target injury to passing pedestrians and motorists, adjacent native plant communities, landscaping, sensitive wildlife habitat (prairie dogs), and nearby beekeeping operations (if present)

• Herbicides can be used immediately adjacent to wetlands, riparian areas, and/or water bodies only if the label indicates its use is appropriate for such areas

• Application of herbicides immediately adjacent to active prairie dog colonies will not be permitted

• Noxious weeds observed in and near the construction area will be treated with herbicides or mechanically removed prior to the start of construction to minimize spread

• Monitor all areas treated for noxious weeds during construction and re-treat, if necessary, to prevent re-establishment of noxious weeds

Delete the last paragraph in Subsection 217.03, "Herbicides shall not be…"

METHOD OF MEASUREMENT

Delete Subsection 217.04 and replace with the following:

Herbicide Treatment shall be measured by the number of person-hours required to apply herbicide, as approved by the Engineer.

Mechanical control shall be included in the cost of Clearing and Grubbing.

Seeding shall be included in the cost of 212 Seeding (Native).

BASIS OF PAYMENT

Section 217.05 shall include the following:

Payment shall be made under:

Pay Item	Pay Unit
Herbicide Treatment	Hour

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

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

DESCRIPTION

240.01 This work consists of protecting migratory birds during construction.

MATERIALS AND CONSTRUCTION REQUIREMENTS

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

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

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

(b) *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

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

shall not proceed within the fenced buffer area until the young have fledged or the nests have become inactive.

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

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

   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.

(c) *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

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

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.

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

METHOD OF MEASUREMENT

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

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 needed to protect migratory birds and nests will be measured and paid for in accordance with Section 607.

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

REVISION OF SECTION 304
AGGREGATE BASE COURSE

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

Subsection 304.02 shall include the following:

Materials for the base course shall be Aggregate Base Course (Class 6) as shown in subsection 703.04.

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

Reclaimed asphalt pavement (RAP), asphalt millings, or asphalt in any form whatsoever shall not be substituted for ABC Class 6.

REVISION OF SECTION 403
HOT MIX ASPHALT

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

Subsection 403.02 shall include the following:

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

TABLE 403-1

Property	Test Method	Value For Grading			
		S (100)	SX (100)		Patching
Air Voids, percent at: N (design)	CPL 5115	3.5 – 4.5	3.5 – 4.5		3.5 – 4.5
Lab Compaction (Revolutions): N (initial) [for information only] N (design)	CPL 5115	8 100	8 100		8 100
Stability, minimum	CPL 5106	30	30		30
Aggregate Retained on the 4.75 mm (No. 4) Sieve for S, SX and SG, and on the 2.36mm (No. 8) Sieve for ST and SF with at least 2 Mechanically Induced fractured faces, % minimum*	CP 45	60	60		60
Accelerated Moisture Susceptibility Tensile Strength Ratio (Lottman), minimum	CPL 5109 Method B	80	80		80
Minimum Dry Split Tensile Strength, kPa (psi)	CPL 5109 Method B	205 (30)	205 (30)		205 (30)
Grade of Asphalt Cement, Top Layer			PG 76-28		PG 76-28
Grade of Asphalt Cement, Layers below Top		PG 64-22			PG 64-22
Voids in the Mineral Aggregate (VMA) % minimum	CP 48	See Table 403-2	See Table 403-2		See Table 403-2
Voids Filled with Asphalt (VFA), %	AI MS-2	65-75	65-75		65-75
Dust to Asphalt Ratio Fine Gradation Coarse Gradation	CP 50	0.6 – 1.2 0.8 – 1.6	0.6 – 1.2 0.8 – 1.6		0.6 – 1.2 0.8 – 1.6

Note:	AI MS-2 = Asphalt Institute Manual Series 2
Note:	Mixes with gradations having less than 40% passing the 4.75 mm (No. 4) sieve shall be approached with caution because of constructability problems.
Note:	Gradations for mixes with a nominal maximum aggregate size of one-inch or larger are considered a coarse gradation if they pass below the maximum density line at the #4 screen. Gradations for mixes with a nominal maximum aggregate size of 3/4" to 3/8" are considered a coarse gradation if they pass below the maximum density line at the #8 screen. Gradations for mixes with a nominal maximum aggregate size of #4 or smaller are considered a coarse gradation if they pass below the maximum density line at the #16 screen.
*Fractured face requirements for SF may be waived by RME depending on project conditions.	

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

Table 403-2

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

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

Hot mix asphalt for intermediate and lifts of patching used on the roadway surface shall conform to the gradation

requirements for Hot Mix Asphalt (Grading S) (100) (PG 64-22). Hot mix asphalt for top lifts of patching used on the roadway surface shall conform to the gradation requirements for Hot Mix Asphalt (Grading SX) (100) (PG 76-28)

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

Contractors proposing to use WMA shall supply detailed design, production and acceptance testing requirements prior to completion of the Form 43. Approved WMA submittals shall contain all of this information prior to CDOT approval. Only CDOT Approved WMA incorporating additives from the Approved Products List (APL) will be allowed for use on the project.

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

Subsection 403.03 shall include the following:

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

Delete subsection 403.05 and replace with the following:

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

Payment will be made under:

Pay Item	**Pay Unit**
Hot Mix Asphalt (Grading SX) (100) (PG 76-28).	Ton
Hot Mix Asphalt (Grading S) (100) (PG 64-22).	Ton
Hot Mix Asphalt (Patching) (Asphalt)	Ton

Aggregate, asphalt recycling agent, additives, hydrated lime, and all other work necessary to complete each hot mix asphalt item will not be paid for separately, but shall be included in the unit price bid. When the pay item includes the PG binder grade, the asphalt cement will not be measured and paid for separately, but shall be included in the work. When the pay item does not include the PG binder grade, asphalt cement will be measured and paid for in accordance with Section 411. Asphalt cement used in Hot Mix Asphalt (Patching) (Asphalt) will not be measured and paid for separately, but shall be included in the work.

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

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REVISION OF SECTION 403
HOT MIX ASPHALT

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

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

REVISION OF SECTION 613
ELECTRICAL CONDUIT

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

Subsection 613.01 shall include the following:

This work includes furnishing and installing either HDPE or PVC electrical conduit. All materials furnished, assembled, fabricate and installed under this item shall be new, corrosion resistant and in strict accordance with the plan sheets and these Special Provisions.

Subsection 613.07 shall include the following:

All conduit shall be Schedule 80 in the diameters, quantities and colors as shown on the project detail sheet and shall be compliant with all ASTM and Bellcore TW-NWT-000356 requirements.

All HDPE conduit shall be factory lubricated, low friction, high-density conduit constructed of virgin high-density polyethylene resin. Conduit shall be capable of being coiled on reels in continuous lengths, transported, stored outdoors, and subsequently uncoiled for installation, without affecting its properties or performance.

All conduit shall be certified by the manufacturer as meeting ANSI/UL 6, 651, or 651A. The manufacturer shall be ISO 9000 compliant.

Electrical Conduit (Bored) shall be HDPE and installed using a trenchless technology of directional boring.

Electrical Conduit (Plastic) shall be PVC or HDPE and installed by direct burial methods such as plowing, open trenching, or other excavation methods.

Each individual conduit shall be equipped with a pull tape as described below. Each bore/trench shall have a copper tracer wire of at least 12 gauge in one of the conduits. In trenches containing multiple conduits, the tracer wire shall not be installed in the same conduit as the fiber.

Each individual conduit shall be equipped with pull tape. The pull tape shall have a minimum tensile strength of 1800 lbs. and be of a design and manufacture that prevents cutting or burning into the conduit during cable installation.

The installation of conduit shall be performed in such a manner as to avoid unnecessary damage to streets, sidewalks, utilities, landscaping, and sprinkler systems. Excavations and conduit installation shall be performed in a continuous operation. All trenches shall be backfilled by the end of a shift. The material from trenching operations shall be placed in a location that will not cause damage or obstruction to vehicular or pedestrian traffic or interfere with surface drainage.

The Contractor shall take all necessary precautions to avoid heaving any existing asphalt/concrete mat or over-excavating a trench, whether caused by equipment directly or by dislodging rocks and boulders. Any such heaving or over-excavation shall be repaired or replaced at the Contractor's expense. The Contractor shall bear the cost of backfilling all over-excavated areas with the appropriate backfill material as approved by the project engineer.

Conduit plugs shall be supplied and installed in all conduit ends as soon as the conduit is installed. Conduit shall be plugged at all termination points such as pull boxes, manholes, controller cabinets, and node buildings. All plugs shall be correctly sized to fit the conduit being plugged. Empty conduits shall be sealed with removable mechanical type duct plugs that provide a watertight barrier and are equipped with a rope tie on the inside end for connection of the pull tape. No foam sealant will be allowed. All plugs and sealant shall be approved prior to construction.

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REVISION OF SECTION 613
ELECTRICAL CONDUIT

The Contractor shall restore all surface materials to their preconstruction condition or better, including but not limited to pavement, sidewalks, sprinkler systems, landscaping, shrubs, sod, or native vegetation that is disturbed by the conduit installation operation. All repairs shall be included in the cost of the conduit.
If the Contractor is unable to bore the conduit at the lengths shown on the plans from access point to access point, all splice couplings and associated work to splice conduit shall be included in the cost of this item. The coupling technology shall allow the conduit to be connected without the need for special tools, and shall form a watertight, airtight seal. Breaking force between segments shall exceed 250 pounds of force. No metal fittings shall be allowed. No elevation difference between the conduit run and the splice location will be allowed. Conduit splices shall be kept to a minimum and all locations shall be approved by the project engineer. Additional pull boxes shall not be substituted for splices.

All conduits shall use sweeps to elevate the buried conduits to the final grade within a pull box or manhole, as shown in the plans. The sweeps shall be terminated within the pull boxes and manholes to allow for easy installation and removal of the conduit plugs. The sweeps shall be set above the ground surface within the pull box at a height that does not interfere with the coiling of the fiber optic cable.

All conduit runs are intended for the future installation of fiber optic cable and shall have a limited number of bends. The sum of the individual conduit bends on a single conduit run between two pull boxes shall not exceed 270º. No individual bend shall be greater than 45º. All conduit bends shall have a minimum acceptable radius of 30 inches.

If new conduits are installed in existing pull boxes, manholes or cabinet bases the Contractor shall carefully excavate around the pull box or manhole and install the new conduit as shown in the plans. The Contractor shall not damage the existing pull box, manhole or their contents. If the existing pull box, lid, or the concrete collars are cracked or damaged during conduit installation, the Contractor shall restore the damaged section to preconstruction condition at no additional cost.

Subsection 613.11 shall include the following:

Electrical Conduit will be measured by the actual number of linear feet that are installed and accepted. Conduit shall also include anchors, bands, skids, sweeps, pull tape, copper tracer wire, adapters, fittings, conduit plugs, installation equipment, splice couplings, mounting brackets and hardware, structure anchors, adhesives, labor, and all other items necessary to complete the work.

Subsection 613.12 shall include the following:

Pay Item	**Pay Unit**
2 Inch Electrical Conduit (Bored)	Linear Foot
3 Inch Electrical Conduit (Bored)	Linear Foot
2 Inch Electrical Conduit (Plastic)	Linear Foot
3 Inch Electrical Conduit (Plastic)	Linear Foot

Electrical Conduit contract unit price shall be full compensation for work described above, specified in the plans, and complete and in place.

REVISION OF SECTION 613
SERVICE METER CABINET

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

DESCRIPTION

Subsection 613.01 shall include the following:

This work consists of the installation of a Service Meter Cabinet including the preformed polymer concrete footing, meter cabinet, mounting hardware, cabinet mounting base, power cables, ultraviolet-resistant (UV-resistant) cables and connection to the power source, and all required wires and wiring to facilitate a fully functioning Service Meter Cabinet at locations as shown on the Plans.

MATERIALS

Subsection 613.02 (l) is hereby added to the Standard Specifications for this project as follows:

(l) Service Meter Cabinet

The Service Meter Cabinet foundation shall be polymer concrete with fiberglass reinforcement. The pad shall be continuous cloth reinforcement on the inside and outside perimeters.

The Service Meter Cabinet shall be National Electrical Manufacturers Association (NEMA) 3R and shall be Underwriters Laboratories (UL) 508 listed as industrial control panel service equipment. It shall have the ability to be padlocked at the location shown on the Service Meter Cabinet detail.

Utility metering compartment shall be protected with a hinged, pad lockable hood.

Service conductor terminations shall be accessible by a removable cover.

The meter main shall be 100 amperes (A) minimum, with voltage range of 120 volts – 480 volts.

The Service Meter Cabinet shall be compatible with both ringless and ring-type meter sockets, and with 4-7 terminals.

Exterior of the Service Meter Cabinet shall be a gray powder-coated aluminum, with a thickness of 1/8 inch which is rain and dust impermeable and electrically welded and reinforced where required.

The Service Meter Cabinet shall have a swing dead front door compartment with distribution and control equipment that is secured with both a latch and a pad lockable draw latch outer door.

All nuts, bolts, screws, and hinges that are used in cabinet construction shall be stainless steel and not visible from outside the meter cabinet.

Service Meter Cabinet and polymer concrete foundation shall have a divider to separate the service and load conduits and conductors.

The Service Meter Cabinet shall provide accommodation for four single branch circuit breakers at a minimum, not including the main breaker. Circuit breakers shall be cable-in, cable-out with line on top, and load on bottom. Handle position shall be up = ON, down = OFF.

The divider plate between the service conduit and load conduit shall be full depth of foundation and be made of preformed polymer concrete.

Unified National Coarse (UNC) thread inserts shall be used.

All materials furnished, assembled, fabricated, or installed shall be new, corrosion resistant, and in strict accordance with the details shown on the Service Meter Cabinet detail and in these Technical Specifications.

Functional Characteristics:
The Service Meter Cabinet shall provide a viewing window in which the meter shall be readable while providing a vandalism resistant enclosure. Viewing window shall be comprised of bullet resistant polycarbonate resin thermoplastic.

Physical Characteristics:
Refer to the Service Meter Cabinet detail for specific dimensions and tolerances.

CONSTRUCTION REQUIREMENTS

Subsection 613.03 (a) is hereby added to the Standard Specifications for this project as follows:

(a) Service Meter Cabinet

The Contractor shall go through the Colorado State Electrical Board to acquire the electrical installation permit prior to the installation of the Service Meter Cabinet equipment for all meters installed by the Contractor, including split meter installations.

Installation shall conform to the latest edition of the National Electrical Code (NEC) and the Authority Having Jurisdiction.

The Service Meter Cabinet shall be factory wired and inspected by the Engineer prior to installation.

Construction methods shall conform to the requirements of Section 614.10 (c), Section 614.10 (d), and Section 614.10 (j).

The Contractor shall certify the records of the testing including grounding, voltage drop (within 3 percent), and other required tests as meeting specification requirements and submit the records to the Engineer.

At the completion of the work and prior to final acceptance, all parts of the work installed under this specification, including the electric meter installation, shall be to the satisfaction of the Engineer, the Electric Service Provider, and the Colorado State Electrical Board inspector.

METHOD OF MEASUREMENT

Subsection 613.11 shall include the following:

Service Meter Cabinet, each, will be measured by the actual number of Service Meter Cabinets installed and accepted.

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REVISION OF SECTION 613
SERVICE METER CABINET

BASIS OF PAYMENT

Subsection 613.12 shall include the following:

Pay Item	**Pay Unit**
Service Meter Cabinet	Each

Service Meter Cabinet payment will include the foundation, all internal wiring, hardware, polymer foundation, excavation, back fill, disposal of excess excavation, crushed rock, Unified National Coarse (UNC) thread inserts, and everything shown on Service Meter Cabinet detail excluding the conduit.

REVISION OF SECTION 613
PULL BOXES

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

Subsection 613.02 shall include the following:

Pull boxes, covers and extensions shall be made of fiberglass reinforced polymer concrete. Pull boxes shall be verified by a 3rd Party Nationally Recognized Independent Testing Laboratory as meeting all test provisions of the latest ANSI/SCTE 77 Specification for Underground Enclosure Integrity, Tier 22 rating. Identification indicating Tier 22 compliance shall be labeled or stenciled on the inside and outside of the box and the underside of the cover. Certification documents shall be submitted with material submittals. The pull box shall have a detachable cover with a skid-resistant surface and have the words "CDOT TRAFFIC" or, "CDOT COMM" cast into the surface. Painting the words shall not be accepted. The cover shall be attached to the pull box body by means of a minimum 3/8 - 7 Unified National Course (UNC) Stainless Steel penta head bolts and shall have two lift slots to aid in the removal of the lid. Lift slots shall be rated for a minimum pull out of 3,000 pounds.

Pull boxes installed in dirt or landscape areas shall have a 12 inch wide by 6 inch thick concrete collar placed around the top as shown on the Project Special Detail Sheet.

All concrete collars shall be Portland Cement Concrete Class B and shall be in accordance with Section 601.

Construction Requirements

Subsection 613.07 shall include the following:

Pull Boxes shall be installed with 2 inches of 3/4 inch granite gravel around the outside of the Pull Box. 3/4 inch granite gravel shall also be installed 12 inches deep below the Pull Box, compacted once at 6 inches deep and again at 12 inches deep. The 3/4 inch granite gravel shall also be installed in the Pull Box 2 inches above the bottom of the Pull Box.

Method of Measurement

Subsection 613.13 shall include the following:

Pull Boxes will be measured by the actual number that are installed and accepted, and shall include base, lid, fiber optic cable brackets, fiber optic location marker posts, excavation, backfill, concrete collars, and crush stone. Pull Boxes shall also include the removal and patching of pavement, sidewalks, curb and gutters and their replacement in kind to match existing grade.

Basis of Payment

Subsection 613.14 shall include the following:

Pay Item	Pay Unit
Pull Box Type 4	Each
Pull Box Type 5	Each

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

REVISION OF SECTION 613
LIGHTING (LUMINAIRE) (LED)(SPECIAL)

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

Subsection 613.02 shall include the following:

The Contractor shall furnish and install LED Street Light Luminaire at locations as shown on the plans. The LED Street Light Luminaire shall be compatible or interchangeable with standard LED Street Light Luminaire as stocked by the CDOT.

The Contractor shall submit a lighting materials list to CDOT for approval prior to ordering.

Subsection 613.08 shall include the following:

At least one grounding electrode shall be installed adjacent to each light standard. Wiring shall be a 120/240 volt or 120/208 volt, 3-wire system with individual luminaire wired for 120 volts.

Subsection 613.12 shall include the following:

Payment will be made under:

Pay Item	**Pay Unit**
Luminaire (LED) (Special)	Each

Luminaire shall be measured and paid by the number of luminaire installed. The item shall include all labor, materials, and ancillary hardware required to provide a fully-functional system to the satisfaction of the Engineer.

REVISION OF SECTION 613
ELECTRICAL CONDUCTOR IDENTIFICATION

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

Section 613.08 shall include the following:

All electrical conductors shall be tagged as follows:

Electrical conductor cable tags shall be located below the termination in the base of the street light, in the pull box, in the pedestal and at the point of termination to existing facilities of the Local Utility Company supplying electrical service. The tags shall be attached with a cable tie. The information written on the tag shall include the direction and approximate length of cable feeds running from where to, etc.

Each incoming conductor shall be individually color coded with 1 tape mark, while outgoing conductors shall have 2 tape marks.

Example:

FEEDS TO PULL BOX
50' NORTH & 75' WEST
THEN TO HIGHWAY SIGN

FEEDS FROM XFMR
250' SOUTH & 75' EAST
200' WEST

Uniform tags are available in a Tag Kit. The Tag Kit consists of: 100 tags, 3 part yellow with 1 hole, 100 black nylon ties and 1 black sharpie pen.

Size	2-1/2" X 5"
Standard Package	Kit
Weight, Kit, Approx.	1.5 Pounds
Color	Yellow

Electrical conductor tagging will not be paid for separately, but shall be included in the cost of the Electrical Conduit and all associated equipment installation.

REVISION OF SECTION 614
TRAFFIC SIGNAL CONTROLLER (TYPE 2070LC)

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

DESCRIPTION

Subsection 614.01 shall include the following:

This work consists of the installation and testing of a Traffic Signal Controller at Traffic Signal Controller Cabinet locations as shown on the plans.

MATERIALS

Subsection 614.08 shall include the following:

The proposed Traffic Signal Controller shall be the Intelight 2070LC Advanced Traffic Controller, manufactured by:

Intelight, Inc.
3450 South Broadmont Drive, Suite 126
Tucson, Arizona 85713
Phone: 520-795-8808
Fax: 520-795-8811
Email: info@intelight-its.com
Website: www.intelight-its.com

The proposed Traffic Signal Controller shall be loaded with local controller software and the Contractor shall furnish all required firmware, firmware licensing, warranty, and support. The proposed Traffic Signal Controller shall include Manufacturer's Hardware Maintenance and Support for three years. If the manufacturer (warrantor) lists the Contractor as the warrantee, it shall be modified prior to project acceptance that the Colorado Department of Transportation (CDOT) is the warrantee and ultimate owner and user of the system. Warranties for the Traffic Signal Controller shall be provided to CDOT. CDOT will not accept the project until the warranties have been provided and transferred to CDOT.

CDOT may, at its discretion, substitute a different Traffic Signal Controller during bench testing in exchange for the proposed Intelight 2070LC. The Contractor shall then install the controller provided as directed by Jim Chase at Region 1 Traffic.

CONSTRUCTION REQUIREMENTS

Subsection 614.10 shall include the following:

The Contractor shall submit materials data sheets to Engineer for approval prior to ordering equipment.

The Contractor shall submit a proposed installation schedule within five business days of receipt of the notice to proceed, which indicates when the proposed Advanced Transportation Controller (Traffic Signal Controller) will be installed by intersection. CDOT will configure the controller in advance of the Contractor picking up the proposed Traffic Signal Controller. The Contractor shall notify the Engineer five to ten business days prior to the installation of the proposed Traffic Signal Controller in the field.

The Contractor shall deliver the Traffic Signal Controller to the Region 1 Signal Shop at 18500 East Colfax Avenue, Aurora, CO 80011 for a period of up to two weeks. CDOT will program timing databases into the Traffic Signal Controller and conduct bench testing. The Contractor shall be responsible for picking up the Traffic Signal Controller at the Region 1 Signal Shop and transporting it to the installation site.

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REVISION OF SECTION 614
TRAFFIC SIGNAL CONTROLLER (TYPE 2070LC)

The Contractor shall install the proposed Traffic Signal Controller at the intersection to which CDOT has designated it. Following the establishment of Ethernet communications to the Ethernet Switch in the cabinet, the Contractor shall establish Ethernet communications between the proposed Traffic Signal Controller and CDOT's traffic signal system software while the existing controller is online and operating the traffic signal in automatic mode, unless otherwise directed by the Engineer. The Contractor shall configure the proposed Traffic Signal Controller in conformance with the manufacturer's recommendations and communication configuration parameters provided by the Engineer.

The Contractor shall coordinate with the Engineer as necessary to establish and confirm communications. The Engineer shall verify communications to the proposed Traffic Signal Controller prior to the removal from operation of the existing controller. In the event that the Engineer cannot verify communications, the Contractor shall troubleshoot the network. If necessary, the Contractor shall work with the Engineer and CDOT Intelligent Transportation Systems (ITS) to troubleshoot the field communications from the intersection, until communications is established.

The Contractor shall re-configure the vehicle detection input cards in the traffic signal cabinet input files, to the CDOT Standard Input File Configuration shown in the special provisions. In the event that insufficient existing detector input hardware is available at the intersection to establish the standard configuration, the Contractor shall notify the Engineer immediately for direction. During the vehicle detection re-configuration, the Contractor shall program the controller operating the traffic signal to run all active phases on max recall.

Upon successful communications with the traffic signal system in this specification, the existing controller shall be removed from the cabinet and the proposed Traffic Signal Controller shall be installed in accordance with manufacturer's recommendations. The Contractor shall start up the proposed Traffic Signal Controller in accordance with CDOT Region 1 maintenance procedures.

In advance of, or immediately following, removal from the cabinet, the Contractor shall mark the existing controller to identify the intersection from which it was removed, if such markings are not already currently legible. The use of permanent marker on the side of the existing controller housing is acceptable.

When the proposed Traffic Signal Controller is installed, the Contractor shall promptly test all inputs and outputs as described in this specification.

The existing controller shall not be removed from operation until the Ethernet communications between the Traffic Signal Controller and the CDOT traffic signal system is confirmed. The existing controller shall not be removed from the project site until all inputs and outputs are as described in this specification and the Engineer accepts the local operation.

The Contractor shall connect the Traffic Signal Controller to the designated controller power outlet without the use of a power strip. The Contractor shall provide additional power strips at the locations called for in the plans.

CDOT will configure the proposed Traffic Signal Controller timing database for the inputs to be consistent with the standard vehicle detection input card configuration.

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REVISION OF SECTION 614
TRAFFIC SIGNAL CONTROLLER (TYPE 2070LC)

Following installation of the Traffic Signal Controller, the Contractor shall verify that all inputs, including but not necessarily limited to, vehicle and pedestrian detector inputs as well as emergency vehicle and rail preemption inputs are received in the proposed traffic signal controller by the appropriate detector. In the event insufficient vehicle or pedestrian traffic is present to verify every active vehicle and pedestrian phase, the Contractor shall manually activate active vehicle or pedestrian detector inputs by driving a vehicle over vehicle detectors or pressing each pedestrian detector button in the field. The Contractor shall not use cabinet interfaces to simulate inputs from pedestrian push buttons, loops, etc.

The Contractor shall test all outputs by verifying that the inputs observed cause the proposed Traffic Signal Controller to activate the desired output.

When existing, the Contractor shall verify Emergency Vehicle Preemption (EVP) inputs and outputs by activating the EVP detectors using an authorized EVP emitter and observing a safe sequence to the dwell interval(s) and that the appropriate dwell interval(s), pedestrian interval, vehicle overlaps, blank-out signs, and advance warning flashers activate, as applicable.

The Contractor shall ensure the conflict monitor is active at all times, and the Contractor shall report any tests that trigger a conflict flash event. The Contractor shall identify and correct issues identified during the installation testing.

If directed by the Engineer due to inappropriate operation of the Traffic Signal Controller, or in the Contactor's interest of public safety, the Contractor shall re-install the same existing controller to temporarily restore acceptable traffic signal operations. In such cases, the Contractor shall notify the Engineer immediately if vehicle detectors must be placed in recall to provide normal operation.

When local operation is demonstrated and accepted by the Engineer, the Contractor shall deliver the existing controller to the Region 1 Signal Shop at 18500 East Colfax Avenue, Aurora, CO 80011 in working order.

The Contractor shall use best cable management practices to secure power and communications cables used for the proposed Traffic Signal Controller within the cabinet in a neat and workmanlike manner, while providing adequate slack at cable ends for device maintenance.

The Contractor shall also highlight the input slots being used on a CDOT Standard Input File Configuration Sheet which will be provided by CDOT with each configured Traffic Signal Controller. The Contractor shall leave the highlighted CDOT Standard Input File Configuration Sheet in each cabinet.

The Contractor shall take pictures of the front and back of each cabinet interior where a Traffic Signal Controller is installed. There shall be a minimum of four pictures taken which shall show the contents of each side of the cabinet interior. The pictures shall document the final vehicle detector input file locations. The Contractor shall also take a picture of the highlighted CDOT Standard Input File Configuration Sheet. All pictures shall be organized per location with the name of the intersection, mile point, and date and shall be submitted to the Region 1 Traffic Signal Supervisor. Pictures shall be well lit and focused.

METHOD OF MEASUREMENT

Subsection 614.13 shall include the following:

All labor, materials, and equipment necessary for the installation of Traffic Signal Controller, including removal and salvage of the existing controller, will be measured by the number of Traffic Signal Controllers installed and accepted.

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REVISION OF SECTION 614
TRAFFIC SIGNAL CONTROLLER (TYPE 2070LC)

BASIS OF PAYMENT

Subsection 614.14 shall include the following:

Payment will be made under:

Pay Item	**Pay Unit**
Traffic Signal Controller (Type 2070LC)	Each

Payment will be full compensation for all labor, materials, and equipment required to complete the work.

Removal and delivery of the existing traffic signal controller to CDOT will not be paid for separately but shall be included in the cost of the work.

CDOT STANDARD INPUT FILE CONFIGURATION

SLOT	1	2	3	4	5	6	7	8	9	10	11	12	13	14
		Count				Count								
Upper	TB2-1,2	TB2-5,6	TB2-9,10	TB4-1,2	TB4-5,6	TB4-9,10	TB6-1,2	TB6-5,6	TB6-9,10		TB8-1,2	TB8-4,6	TB8-7,9	TB8-10,12
	PH 1	PH 2	PH 2	PH 2	PH 3	PH 4	PH 4	PH 4	PH 1		Manual	PED 2	PED 6	FLASH
	E,C	E,C	E,C	C	E,C	E,C	E,C	C	E,C		Advance			SENSE
	Stop	ADV	ADV	Stop	Stop	Stop	ADV							
		Lane 1	Lane 3			Lane 1	Lane 1			* * *	N A			* * *
	D# 1	D# 2	D# 4	D# 6	D# 7	D# 8	D# 10	D# 12	D# 13			Ped#2	Ped#6	
I FILE	C1-56	C1-39	C1-63		C1-58	C1-41	C1-65		C1-60		C1-80	C1-67	C1-68	C1-81
	Count	Count			Count	Count								
	TB2-3,4	TB2-7,8	TB2-11,12	TB4-3,4	TB4-7,8	TB4-11,12	TB6-3,4	TB6-7,8	TB6-11,12	* * *	N A	PED 4	PED 8	* * * STOP
	Ph 1	PH 2	PH 2	PH2 2	PH 3	PH 4	PH 4	PH 4	PH 3					TIME
	E,C	E,C	E	C	E,C	E,C	E	C	E,C		TB8-3	TB8-5,6	TB8-8,9	TB8-11,12
		ADV	ADV			Stop	ADV				Manual			
Lower		Lane 2	Lane 4			Lane 2	Lane 2				Enable			
		D# 3	D# 5			D# 9	D# 11		D# 14			Ped#4	Ped#8	
		C1-43	C1-76	C1-47		C1-45	C1-78	C1-49	C1-62		C1-53	C1-69	C1-70	C1-82

SLOT	1	2	3	4	5	6	7	8	9	10	11	12	13	14
		Count				Count								
Upper	TB3-1,2	TB3-5,6	TB3-9,10	TB5-1,2	TB5-5,6	TB5-9,10	TB7-1,2	TB7-5,6	TB7-9,10		TB9-1,3	TB9-4,6	TB9-7,9	TB9-10,12
	Ph 5	Ph 6	PH 6	PH 6	PH 7	PH 8	PH 8	PH 8	PH 5		Spare			
	E,C	E,C	E,C	C	E,C	E,C	E,C	C	E,C	* * *	N A	EVA	EVB	RR 1
	Stop	ADV	ADV	Stop	Stop	Stop	ADV					2&5	4&7	
		Lane 1	Lane 3			Lane 1	Lane 1							
	D# 15	D# 16	D# 18	D# 20	D# 21	D# 22	D# 24	D# 26	D# 27			P# 3	P# 4	P# 1
J FILE	C1-55	C1-40	C1-64		C1-57	C1-42	C1-66		C1-59		C1-54	C1-71	C1-72	C1-51
	Count	Count			Count	Count								
	TB3-3,4	TB3-7,8	TB3-11,12	TB5-3,4	TB5-7,8	TB5-11,12	TB7-3,4	TB7-7,8	TB7-11,12		TB9-2,3	TB9-5,6	TB9-8,9	TB9-11,12
	Ph 5	PH 6	Ph 6	Ph 6	PH 7	Ph 8	Ph 8	Ph 8	PH 7		Spare			
	E,C	E,C	E	C	E, C	E,C	E	8 C	E,C	* * *	N A	EVC	EVD	RR 2
		ADV	ADV			Stop	ADV					6&1	8&3	
Lower		Lane 2	Lane 4			Lane 2	Lane 2							
		D# 17	D# 19			D# 23	D# 25		D# 28			P# 5	P# 6	P# 2
		C1-44	C1-77	C1-48		C1-46	C1-79	C1-50	C1-61		C1-75	C1-73	C1-74	C1-52

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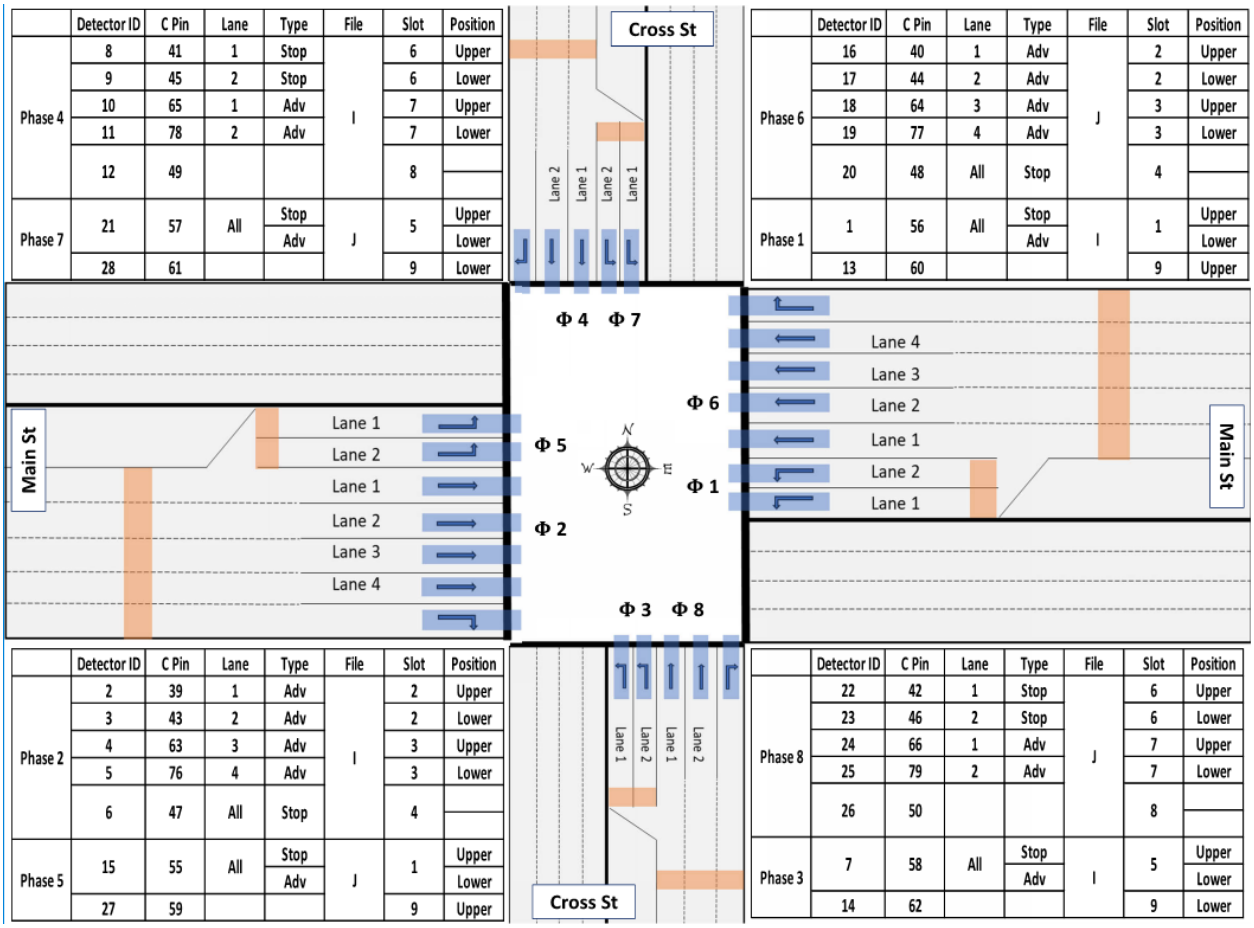
REVISION OF SECTION 614
TRAFFIC SIGNAL CONTROLLER (TYPE 2070LC)

CDOT TYPICAL DETECTOR LAYOUT

	Detector ID	C Pin	Lane	Type	File	Slot	Position
Phase 4	8	41	1	Stop	I	6	Upper
	9	45	2	Stop		6	Lower
	10	65	1	Adv		7	Upper
	11	78	2	Adv		7	Lower
	12	49				8	
Phase 7	21	57	All	Stop	J	5	Upper
				Adv			Lower
	28	61				9	Lower

	Detector ID	C Pin	Lane	Type	File	Slot	Position
Phase 6	16	40	1	Adv	J	2	Upper
	17	44	2	Adv		2	Lower
	18	64	3	Adv		3	Upper
	19	77	4	Adv		3	Lower
	20	48	All	Stop		4	
Phase 1	1	56	All	Stop	I	1	Upper
				Adv			Lower
	13	60				9	Upper



	Detector ID	C Pin	Lane	Type	File	Slot	Position
Phase 2	2	39	1	Adv	I	2	Upper
	3	43	2	Adv		2	Lower
	4	63	3	Adv		3	Upper
	5	76	4	Adv		3	Lower
	6	47	All	Stop		4	
Phase 5	15	55	All	Stop	J	1	Upper
				Adv			Lower
	27	59				9	Upper

	Detector ID	C Pin	Lane	Type	File	Slot	Position
Phase 8	22	42	1	Stop	J	6	Upper
	23	46	2	Stop		6	Lower
	24	66	1	Adv		7	Upper
	25	79	2	Adv		7	Lower
	26	50				8	
Phase 3	7	58	All	Stop	I	5	Upper
				Adv			Lower
	14	62				9	Lower

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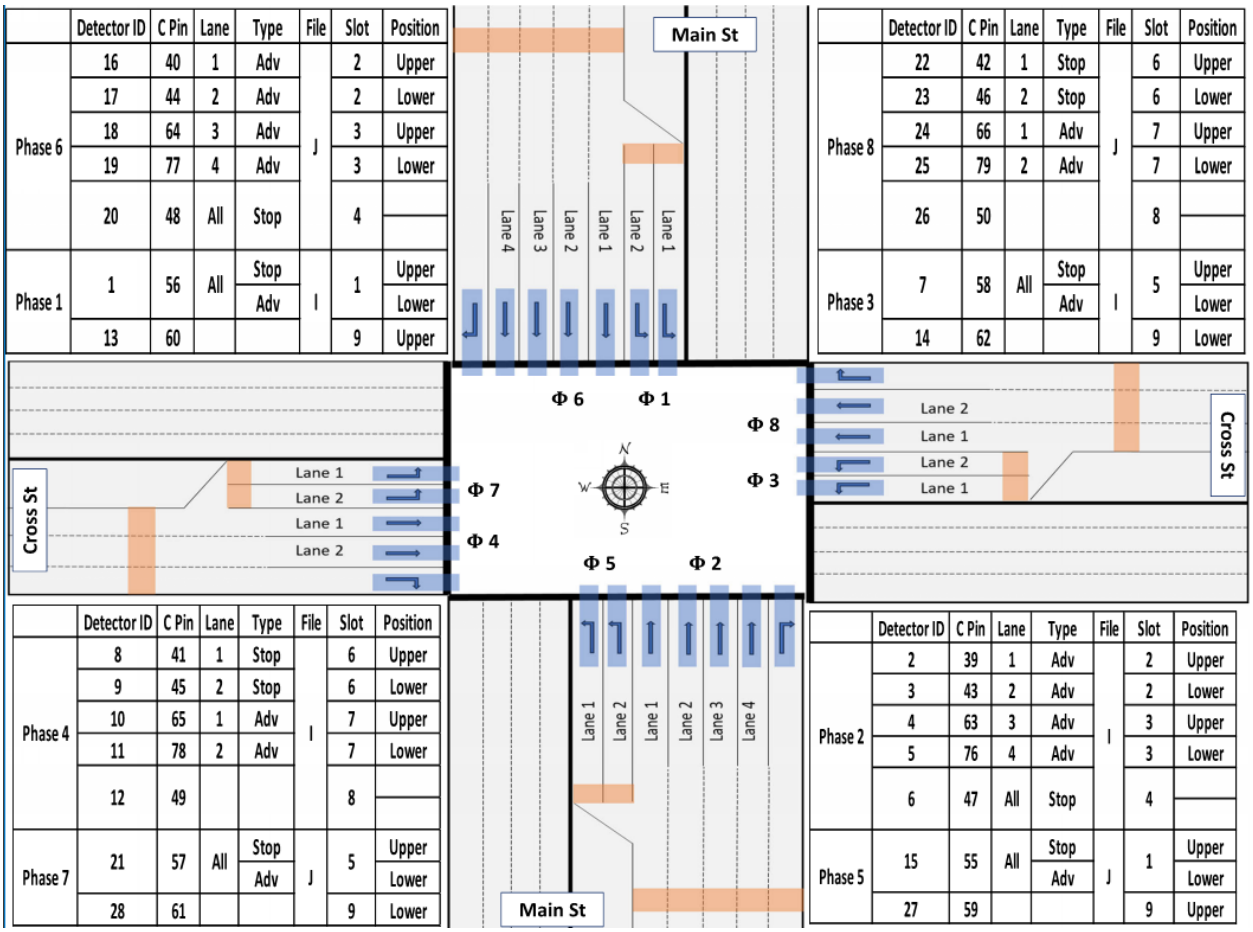
REVISION OF SECTION 614
TRAFFIC SIGNAL CONTROLLER (TYPE 2070LC)

CDOT TYPICAL DETECTOR LAYOUT

	Detector ID	C Pin	Lane	Type	File	Slot	Position
Phase 6	16	40	1	Adv	J	2	Upper
	17	44	2	Adv		2	Lower
	18	64	3	Adv		3	Upper
	19	77	4	Adv		3	Lower
	20	48	All	Stop		4	
Phase 1	1	56	All	Stop	I	1	Upper
				Adv			Lower
	13	60				9	Upper

	Detector ID	C Pin	Lane	Type	File	Slot	Position
Phase 8	22	42	1	Stop	J	6	Upper
	23	46	2	Stop		6	Lower
	24	66	1	Adv		7	Upper
	25	79	2	Adv		7	Lower
	26	50				8	
Phase 3	7	58	All	Stop	I	5	Upper
				Adv			Lower
	14	62				9	Lower



	Detector ID	C Pin	Lane	Type	File	Slot	Position
Phase 4	8	41	1	Stop	I	6	Upper
	9	45	2	Stop		6	Lower
	10	65	1	Adv		7	Upper
	11	78	2	Adv		7	Lower
	12	49				8	
Phase 7	21	57	All	Stop	J	5	Upper
				Adv			Lower
	28	61				9	Lower

	Detector ID	C Pin	Lane	Type	File	Slot	Position
Phase 2	2	39	1	Adv	I	2	Upper
	3	43	2	Adv		2	Lower
	4	63	3	Adv		3	Upper
	5	76	4	Adv		3	Lower
	6	47	All	Stop		4	
Phase 5	15	55	All	Stop	J	1	Upper
				Adv			Lower
	27	59				9	Upper

REVISION OF SECTION 614
TRAFFIC SIGNAL CONTROLLER CABINET

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

MATERIALS

In subsection 614.08, delete (c) and replace with the following:

(c) Controller Cabinets. The controller cabinet shall be a double wide Model 332 herein referred to as a Model 332D as specified in the Contract. The input files shall meet the requirements of the split input file below. Unless otherwise specified in the Contract, the cabinet shall include the following:

Quantity	Item
4 each	Light Emitting Diode (LED) work light, mounted to chassis rail, 6000 Kelvin (K), Cool White, 300 lumen/foot output
4 each	Model 430 Transfer Relays
2 each	Model 204 2-Circuit Flasher (cube type, 25 ampere (A) output)
12 each.	Model 200 Load Switch (cube type, 25A output)
3 each	Model 242 Direct Current (DC) Isolators
6 each	Model 222 Loop Amplifiers
1 each.	Signal Monitor Unit with absence of red monitoring (refer to Revision of Section 614 – Conflict Monitor, paid separately from cabinet).
2 each	New York 330 Pull-out Drawer Assembly
1 each	Auxiliary Detector Termination Panel Assembly
1 each	Transient Voltage Surge Suppression System
2 each	Split Input File
1 each	Output file

Cabinet nominal dimensions: 66 inches x 49 inches x 30 inches.

Each cabinet shall have four doors and Corbin #2 Locks.

The left side of the Model 332D cabinet assembly shall have shelves attached to the Electronic Industries Alliance (EIA) rack assembly to house additional equipment such as, but not limited to, video detection, standby Uninterrupted Power Supply (UPS) and communication equipment.

The left side of the Model 332D cabinet assembly shall have pull out shelves to accommodate maintenance of the Traffic UPS batteries. The shelves for the UPS batteries shall be capable of handling the weight of the batteries plus 50 percent additional weight. The sliding shelf shall utilize ball bearing construction. The shelf shall include a rail of a minimum of 2 ½ inches to contain the batteries while sliding the shelf. These shelves shall have a double locking mechanism to prevent the shelves from moving unexpectedly in either the fully open or fully closed position. This locking mechanism shall not require any tools to operate. The cabling system between the UPS and the batteries shall be of sufficient length to accommodate the full movement of the shelf and be protected as to avoid damage while the shelf is in motion.

The cabinet shall have a silver polyester triglycidyl isocyanurate (TGIC) powder coating base. Top coating shall be anti graffiti powder paint applied at a thickness of 2.4 milliinches (mils).

The inside of the cabinet shall be painted white.

A male generator plug shall be included.

REVISION OF SECTION 614
TRAFFIC SIGNAL CONTROLLER CABINET

The cabinet shall be supplied with a Model 206L Power Supply Unit as detailed in Caltrans Transportation Electrical Equipment Specification (TEES) 2009

The cabinet shall be supplied with a Contactor Relay to replace the Mercury Contactor Relay. The Contactor Relay shall be the same or equivalent as the Flash Transfer Relay. The Contactor Relay shall have an operating voltage of 120 Volts Alternating Current (VAC) and contacts rated for 30A minimum. The Contactor Relay shall be in the de-energized position under normal operating conditions and energized when the cabinet is in the FLASH mode. The Contactor Relay shall have an internal lamp that will be ON when the Relay is energized. The Contactor Relay shall be installed on the back of the Power Distribution Assembly. The Contactor Relay shall be easily replaced by hand and not interfere with the existing cabinet wiring harness distribution.

The cabinet shall be supplied with a 30A, 120 VAC single pole main breaker mounted on the service panel assembly. The breaker shall be supplied with a handle guard to prevent incidental contact with handle. The handle guard shall not interfere with the handle or breaker operation.

Additional ventilation shall be comprised of two additional exhaust fans installed in the 332D cabinet as requested. The additional equipment shall be the same type as required in the specifications and controlled in the same manner.

The cabinet shall have a hinged protective shield over the Circuit Breakers to prevent them from being accidentally turned off. The hinged shield shall be mounted in such a way that the switches are still readily visible to the technician and can be easily turned on or off.

1. *Output file*. The output file shall have eight "flash programming jumper blocks," one for each of the eight phases. The output file shall utilize 12 position terminal blocks.

2. *Split Input file.* The split input file shall be an SF 170, which will operate in the standard 332/336 cabinets. The input file shall use a split 22-pin connector (2 rows or 22 pins) which provide for 44 unique contacts, rather than the 22 double contacts as provided by the former input file. This design shall interface electrically with National Electrical Manufacturers Associations (NEMA) Transportation Systems 1 (TS1) controllers, NEMA TS2 controllers, Model 170 controllers, and 2070 controllers.

   The input file shall be divided into two partitions. The first partition shall include the first eight slots from the left; the second partition shall include the next six slots.

   The serial/Transistor-Transistor Logic (TTL) transmit and receive pairs shall be wired across the back panel. Transmit0 (TX0), Receive0 (DX0), and Ground0 serve the first eight slots; TX1, DX1 and Ground1 serve the next six slots. Backplane addressing is automatically assigned in the rear of the input file, such that Slot 1 – Address 0, Slot 2 – Address 1 . . . Slot 8 = Address 7(all three lines low).

   Addressing from the front of any input device shall override the backplane addressing.

   Serial connections shall use a standard quick lock connection.

3. *Transient Voltage Surge Suppression Unit.* Transient Voltage Surge Suppression (Surge Protection) shall be a solid-state device with a maximum surge current capacity of 6500 peak current amperes x 1 @ 8 X 20 microsecond wave.

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REVISION OF SECTION 614
TRAFFIC SIGNAL CONTROLLER CABINET

The unit shall be listed to the current edition of Underwriters Laboratory (UL 1449). The enclosure is to be rated as a NEMA 1 and resistant to oil, moisture, dust and other airborne contaminants.

The units shall be fused (no thermo fusing allowed). Components shall be suitably spaced and have a sub-nanosecond response time (potting compound is not allowed). The Surge Protection is to be suitable for continuous line voltage of a maximum of 130 volts. Nominal clamping voltage shall be no more than 200 volts.

The unit shall have a failure indicator and alarm suitable for Remote Terminal Unit (RTU) connection.

The operating temperature shall be -40ºC to +70ºC. Electromagnetic Interference – Radio-Frequency Interference (EMI-RFI) noise attenuation to 40 decibels (dB). Capacitance shall be 1 to 1.5 microfarad per line.

Neutral-to-ground/phase-to-ground connection is not allowed. The unit shall be modularly designed for quick replacement with no tools needed. The unit shall have a retaining clip to secure the device in place.

The unit shall be mounted no more than 8 inches from the incoming power termination point and terminated in parallel with the incoming power.

The Manufacturer must have a satisfactory performance record with this specific device for a minimum of five years.

All of the above components provided, excluding the signal monitor unit, shall be on the Colorado Department of Transportation (CDOT) Approved Products list.

BASIS OF PAYMENT

Subsection 614.14 shall include the following:

Payment will be made under:

Pay Item	**Pay Unit**
Traffic Signal Controller Cabinet	Each

REVISION OF SECTION 614
ETHERNET SWITCH (3930)

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

DESCRIPTION

For this project Ethernet Switch shall be a Ciena 3930 Carrier Ethernet Service Delivery Switch (SDS) for installation in individual Intelligent Transportation Systems (ITS) device communication cabinets and/or variable message sign cabinets to transport Ethernet data to and from ITS Node Buildings and roadway ITS devices as shown in the project plans. All Ethernet switches shall be manufactured by Ciena.

The Ethernet switch shall utilize Coarse Wavelength Division Multiplexing (CWDM) and Small Form-factor Pluggable (SFP) optic modules. Each switch shall be provided with both a CWDM SFP optic module and a 1310 nm SFP optic module where a two switch per wavelength deployment is utilized (typical design). The Contractor is advised that in certain cases there are more than two switches per wavelength and when this occurs, the switch or switches in the middle shall utilize two 1310 nm SFP optic modules. Optic modules shall be provided as described in the Project Specifications, 614 – CWDM SFP and 614 – Small Form-Factor Pluggable – 1310 nm SFP as part of this specification package. All optic modules for the Ciena 3930 shall be paid for as part of the Ethernet switch pay item.

The Ethernet switches shall interface with existing Ciena 5150 Ethernet aggregation switches located in existing regeneration node buildings along the project corridor. Since no new Ciena 5150 switches are being installed as part of this project, all necessary Ciena 5150 components shall be paid for as part of the Ethernet switch pay item.

A single mode, 9/125um CWDM wavelength independent attenuator to match the wavelength of the SFP optic modules shall be included and installed in the communications cabinet termination patch panel. Optical attenuators shall be provided as described in the Project Specification, 614 - Coarse Wavelength Division Multiplexing Attenuator.

MATERIALS

The Ethernet switch shall be configured with two (2) 1GIG/10GIG SFP+ ports, four (4) 100M/1000M SFP ports and two (2) 10/100/1000M RJ-45 Ethernet ports. User Network Interface (UNI) ports are not required as part of the Ethernet switch.

The Contractor shall furnish and install the Ethernet switch and associated items shown in Item Table A below. The Contractor shall also furnish the Ethernet switch software and maintenance licenses show in Item Tables B and C. Tables A, B and C describe items for a single Ciena 3930 SDS Ethernet switch.

Item Table A – Ciena 3930 SDS Ethernet Switch, Typical Hardware Description

ITEM DESCRIPTION	ITEM NUMBER	QUANTITY
3930, (4) 100/1000M SFP, (2) 100/1000M RJ-45, (2) 1G/10G SFP+, EXT.TEMP, (2)SLOTS AC/DC POWER SUPPLY	170-3930-900	1
3930, AC PLUGGABLE POWER SUPPLY, WIDE RANGE 120/240V	170-0014-900	2
AC POWER CORD, IEC C13, NORTH AMERICA	CABL-PW01NA	2
3930 19 INCH RACK MOUNT EARS, FOR USE WITH 1 RU CHASSIS	170-0602-903	2
10-LAMBDA CWDM MUX/DEMUX W/EXPANSION PORT, 2-SLOT LGX RACK MODULE, LC/APC CONNECTOR (refer to 614 – CWDM Module) (for existing Ciena 5150 switches)	CWDM-EMUX10	As required per Plans

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REVISION OF SECTION 614
ETHERNET SWITCH 3930

12-SLOT LGX MOUNTING PANEL W/INTEGRATED FIBER MANAGEMENT, 4RU (refer to 614 – CWDM Module) (for existing Ciena 5150 switches)	CWDM-PAN012	As required per Plans
10/100/1000M, SFP TRANSCEIVER, RJ45 CONNECTOR, SGMII, 100 METERS, EXTENDED TEMPERATURE	XCVR-A00CRJ	2
100M/1GIG, SM SFP OPTIC, LC CONNECTOR, 10 KM, 1310 NM, EXTENDED TEMPERATURE (refer to 614 – Small Form-factor Pluggable SFP)	XCVR-A10Y31	As required per Plans
100M/1GIG, SM SFP OPTIC, LC CONNECTOR, 80 KM, 1**xx**0 NM,EXTENDED TEMPERATURE (refer to 614 – CWDM SFP) (for Ciena 3930 and existing Ciena 5150 switches)	XCVR-A80D**xx**	As required per Plans

xx – values range from 43 to 61 based on required CWDM wavelengths (1430 nm to 1610

nm) Item Table B – Ciena 3930 SDS Ethernet Switch, Typical Software Description

ITEM DESCRIPTION	**ITEM NUMBER**	**QUANTITY**
SAOS ADVANCED ETHERNET PERPETUAL SOFTWARE LICENCE FOR 3930	S70-0001-900	1
SAOS ADVANCED OAM PERPETUAL SOFTWARE LICENCE FOR 3930	S70-0001-901	1
SAOS ADVANCED SECURITY PERPETUAL SOFTWARE LICENCE FOR USE WITH SAOS 6.X	170-0204-900	1
ESM CARRIER ED RIGHT TO MANAGE PERPETUAL SOFTWARE LICENSE FOR 3930	S70-0005-900	1

Item Table C – Ciena 3930 SDS Ethernet Switch, Typical Maintenance License

ITEM DESCRIPTION	**ITEM NUMBER**	**QUANTITY**
SMARTSUPPORT, 3930, 3 YEARS	80M-3930-SSP	1
HARDWARE REPAIR SERVACE 10 DAY MAINTENANCE, 3930, 2 YEARS	80M-3930-HWM	1
NEXT BUSINESS DAY MANAGED SPARES, CN 3930, 3 YEARS	80M-3930-NBS	1

Matching CWDM SFP optic modules shall also be provided for existing Ciena 5150 Ethernet aggregation switches in each of the regeneration node buildings to which the Ciena 3930 switches communicate since these Ciena 5150 switches are existing and not purchased as part of this project. In addition to the CWDM SFP optic modules are the required LGX mounting panels and 10-λ CWDM mux/demux rack modules. Quantities for these Ciena 5150 Ethernet aggregation switch CWDM SFP optic modules, LGX mounting panels and 10-λ CWDM mux/demux rack modules are identified in these material tables and are included in the tabulations within the Plans.

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REVISION OF SECTION 614
ETHERNET SWITCH 3930

Each Ethernet Switch shall be furnished and installed with a G.8032 ring protection configuration in conformance with Ciena's Ethernet Design and Configuration Services per the Colorado Department of Transportation requirements either prior to installation or at the individual installation sites.

Preliminary configuration including all IP schema design for data transport will be conducted by CDOT personnel prior to installation. All final configurations and G.8032 configuration shall also be conducted by CDOT personnel.

If field changes are made which affect the original Contractor's material order for the Ethernet switches and require any reconfiguration of the original Ethernet switch material orders, the Contractor shall ensure that the Ciena representative is contacted and made aware of such changes to alleviate any possible delays in delivery and installation. If for any reason the switch or associated materials are defective or are damaged at the time of installation by either the Contractor or by Ciena, the item shall be removed and replaced at no additional cost to the project. Items shall also be replaced if any failures occur due to manufacturer's defects, at no additional cost to the project prior to the final acceptance.

CenturyLink is the direct contracted equipment supplier of Ciena Corporation for the State of Colorado, Colorado Department of Transportation for networking equipment and associated network materials. For project equipment estimate quotations and purchasing, Contractors shall contact the following distributer representative:

CenturyLink Government Contact Representative

Keith A. Glose
Premier Account Manager
CenturyLink Government
930 15th Street, 4th Floor, Denver, Colorado 80202
Telephone: 303-992-5567 Fax: 720-578-2694
E-Mail: keith.glose@centurylink.com

Neither CenturyLink nor Ciena Corporation has been involved in the design of the project network. The Contractor shall contact the CenturyLink representative for equipment quotations and purchasing purposes only. The Contractor shall not contact or rely on either CenturyLink or Ciena for network design related questions.

When requesting quotations, the Contractor shall submit to CenturyLink a complete package including the following items:

1. A complete list of required equipment for purchase including materials and quantities based on the individual pay item project specifications including those stated under the Method of Measurement section of the specification to achieve a complete item(s) installation per the project plans.
2. A PDF copy of all project specifications pertaining to the material being ordered.
3. A PDF copy of all networking project plan sheets.

It is the Contractor's responsibility to provide the distributer's representative all information required pertaining to the complete network design as shown in the project plans. During the bidding process, CenturyLink or Ciena Corporation is not responsible for any type of network design aide. All questions pertaining to the network design shall be
conducted through the Project Engineer for help or clarification.

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REVISION OF SECTION 614
ETHERNET SWITCH 3930

CONSTRUCTION REQUIREMENTS

The 3930 SDS Ethernet switch will be installed in a communications cabinet or variable message sign and connected via the fiber optic backbone to a communications node building in a protected ring design. Each switch shall normally have both a CWDM SFP optic module and a 1310nm SFP optic module, except as previously noted where there are more than two switches per wavelength. Each switch shall be configured as part of creating a single carrier Ethernet diverse path sub-ring.

For connection of the switch to the optical fiber network, one (1) lateral fiber optic cable shall be terminated and patch cables shall be installed and connected to the optical ports of the switch. A total of four (4) lateral fiber strands shall be used for data communications to the switch. Two (2) lateral fiber strands shall be used for communications connecting the SFP optics carrying CWDM traffic and two (2) lateral fiber strands shall be used for communications connecting the 1310 nm SFP optics, except as noted where there are more than two switches per wavelength.

Additional splicing is required for the CWDM optical filters at each Ciena 3930 location. The CWDM optical filters shall be used to split a single CWDM wavelength from the multiple wavelengths being transmitted along the fiber strands, including passing a 1310 nm wavelength between Ciena 3930 switch pairs. See Plan sheets for splicing details and 614 – Single Wavelength CWDM Optical Filter.

The Contractor shall provide single mode, bend insensitive, pre-connectorized duplex patch cables with a polyurethane jacket for connection from the coarse wavelength division multiplexing SFP optic module and the 1550 nm SFP optic module. Connectors for the patch cable shall be LC on the Ethernet switch end and ST on the termination end. For Ethernet switches in node buildings, if applicable, proposed termination panels may use LC connectors to accommodate the high termination requirements of the proposed fiber optic cable, accordingly LC-to-LC patch cables could be required at these locations.

The patch cable shall be of sufficient length to span from the termination patch panel to the Ethernet switch SFP ports with a maximum of two (2) feet of slack. They shall be installed in a manner which will not interfere with internal device equipment in the switch enclosure and will include cable management so as not to interfere with future maintenance within the enclosure.

For installations in variable message signs, the Contractor shall install an aluminum backplane on the internal structural supports of the sign housing. It shall be mounted in a location which will not interfere with internal equipment and future maintenance of the variable message sign electronics and cabling. The Ethernet switch shall not be mounted directly on to the variable message sign cabinet wall or sign support.

All material required for mounting of the Ethernet switch in the variable message sign cabinet shall be included in the price of the Ethernet switch.

A field site survey for final placement of the Ethernet switch in the variable message sign cabinet shall be conducted prior to installation.

If required the Contractor shall arrange to provide for a certified Ciena representative either on site or via remote access through the Colorado Transportation Management Center network to aid in the configuration and installation of the
Ethernet switch.

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REVISION OF SECTION 614
ETHERNET SWITCH 3930

METHOD OF
MEASURMENT

Ethernet Switch 3930 will be measured by the actual number of Ciena 3930 Carrier Ethernet Service Delivery Switches installed and accepted for a complete installation. Also included shall be CWDM SFP optic module (for both Ciena 3930 and existing Ciena 5150 switches), 1310 nm SFP optic module, LGX mounting panel (for existing Ciena 5150 switches), CWDM mux/demux LGX rack module (for existing Ciena 5150 switches), RJ-45 SFP modules, optical attenuator, power supplies, power cables, CAT6 Ethernet cables, single mode fiber optic pre-connectorized bend insensitive patch cables, material for the Ethernet switch attachment to the interior of the variable message sign, licenses, switch software, wiring, documentation, and configuration by the Ciena representative. All costs associated with arranging for a Ciena representative to be either on-site or via remote access will not be paid for separately, but shall be included in the cost of the item.

BASIS OF PAYMENT

Payment will be made under:

Pay Item	**Pay Unit**
Ethernet Switch (Type II)	Each

Payment will be full compensation for all labor, materials and equipment required to complete the work. Contractor shall verify quantity prior to ordering switches.

REVISION OF SECTION 614
MICROWAVE VEHICLE RADAR DETECTOR

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

DESCRIPTION

Subsection 614.01 shall include the following:

This work shall consist of furnishing and installing traffic signal vehicle detectors in accordance with these Special Provisions at the locations shown on the Plans. The Contractor shall order a continuous tracking advance detector, configuration software, mounting hardware, and compatible shelf-mounted cabinet interface components.

MATERIALS (Pole or Mast Arm Mounted)

Subsection 614.08 shall include the following:

The Traffic Signal Vehicle Detector (Advance Microwave) shall include the continuous tracking advance detector unit, standard combination power/data cable with connector, required length communication cable to reach from pole mounted device to traffic signal controller cabinet, pole mount hardware, mini splice boxes, a Synchronous Data Link Control (SDLC) cabinet interface, and configuration software.

The continuous tracking advance detector unit shall be a non-intrusive device using frequency modulated continuous wave radar technology for the gathering of vehicle information including lane occupancy, speed, vehicle classification, presence, dynamic density, and Estimated Time of Arrival (ETA). It shall have capabilities to dynamically track up to 25 vehicles over the entire detection area simultaneously and accurately detect partially occluded vehicles. It shall also support the configuration of up to eight channel outputs with up to four alerts per channel and up to four zones per alert, resulting in 32 configurable alerts and 128 configurable zones. Weather shall not impact the radar detection of the unit. Wind or temperature change shall not cause the device's original field installation configuration to alter over time. The radar detection unit shall include the manufacturer's recommended power/communication cable. The radar detection unit shall meet the following minimum requirements:

(1)	Vehicle Detections:	Up to 25 vehicles simultaneously
(2)	Detection Range:	50 to 900 feet
(3)	Vertical 6 dB beam width:	65º
(4)	Horizontal 6 dB beam width:	10.5º
(5)	Operating Frequency:	10.5 to 10.55 Gigahertz (GHz) (X-Band)
(6)	Communications:	RS-485
(7)	Power:	3.2 watts at 9 to 28 Volt*s* Direct Current (DC)
(8)	Operating Temperature:	-40ºF to +165ºF (Ambient)
(9)	Humidity:	Up to 95% Relative
(10)	Shock:	10G, 11 milliseconds (ms) Half Sine Wave

MATERIALS (Mounted Inside Traffic Control Cabinet)

Subsection 614.08 shall include the following:

There shall be a cabinet interface device that provides DC power to up to 6 traffic signal vehicle detectors and communicates with contact closure devices, Ethernet, and controllers through SDLC. The power supply shall accept input voltage from 90 to 260 Voltage Alternating Current (VAC) at 50 to 60 hertz (Hz) and provide 24 Voltage Direct Current (VDC) output at 1 ampere (A). The power supply shall have a minimum operating temperature range of -29˚F to 165˚F up to 95 percent relative humidity. The power supply shall protect against static voltage dips, transient

failures of supply voltage, and continuous phase failures. The cabinet interface device shall provide power and surge protection for Recommended Standard-232 (RS-232), RS-485, and DC power.

CONSTRUCTION REQUIREMENTS

Subsection 614.09 shall include the following:

The Contractor shall install the unit in accordance with the manufacturer's recommendations. Construction shall include all necessary work to provide a fully operable unit, including mounting the device and bracket, aligning the sensor, connecting the sensor to the traffic signal controller cabinet, and any necessary wiring at the device or inside the cabinet. Construction shall also include the installation and setup of the SDLC cabinet interface device.

The manufacturer's recommended power/communication cable shall run on the interior of the traffic signal mast arm, traffic signal pole, or other mounting structure and in pull boxes and conduit from the radar unit to the traffic signal controller cabinet. An access hole, not to exceed 1 ½ inches in diameter, may be made in traffic signal structures to allow passage of the power/communications cable into the structure. All holes shall be free of burrs and sharp edges prior to the installation of all cables. All cable entrances in structures, conduits, and cabinets shall be sealed and waterproofed. The Contractor shall ensure strain relief and drip loops in the power/communication cable in accordance with the manufacturer's recommendations. All wiring and electrical connections shall be performed in conformance with the latest version of the National Electrical Code (NEC).

The Contractor shall configure the radar detection unit to detect all through lanes, in accordance with the manufacture's recommendations, unless otherwise directed by the Project Engineer.

METHOD OF MEASUREMENT

Subsection 614.13 shall include the following:

The Traffic Signal Vehicle Detector (Advance Microwave) will be measured by the actual number of units installed and accepted, and will include warranty, testing, documentation, radar detection unit, cabinet interface device, power supply, power source termination, surge suppressor, installation hardware, all necessary wiring, communication cables, labor and all other items necessary to complete the work. Testing will be measured by verification of vehicle detection, speed, and ETA of all lanes with 90 percent accuracy.

BASIS OF PAYMENT

Subsection 614.14 shall include the following:

The accepted quantities will be paid for at the contract unit price for the pay item listed below.

Payment will be made under:

Pay Item	Pay Unit
Microwave Vehicle Radar Detector	Each

REVISION OF SECTION 614
TRAFFIC SIGNAL UNINTERRUPTED POWER SUPPLY

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

MATERIALS

Subsection 614.08 shall include the following:

1. *Traffic Uninterrupted Power Supply (UPS).* The Model 332D cabinet shall have a Traffic UPS as specified below rack mounted equipment in the left cabinet. The Traffic UPS shall consist of three major components, the Electronics Module, the Power Interface Module (PIM), and the Battery System.

   The Traffic UPS shall provide two modes of operation: Standby will introduce battery power upon loss of utility power, and On – Line shall flow 100 percent of the load through the inverter 100 percent of the time. The mode of operation shall be user selectable.

Input Voltage:	75 Volts Alternating Current (VAC) to 155 VAC
Input Frequency:	60 hertz (Hz) (+/- 5%)
Output Voltage:	120 VAC (+/- 3%)
Output Frequency:	60 Hz (+/- 5%)

   The user shall have the capability to program the intersection run time based on time and/or percentage of battery power before going into a flash mode of operation.

   Up to the maximum rating, the Traffic UPS shall be capable of running any combination of signal heads, whether Incandescent, Light Emitting Diode (LED), or Neon, by any manufacturer, regardless of power factor, without overdriving the poorer power factor LED heads which may cause early degradation, low luminosity, or early signal failure.

   Upon loss of utility power, the Traffic UPS shall insert battery power into the system via a supplied PIM. In case of UPS failure and/or battery depletion, the PIM shall ensure that the UPS will drop out and, upon return of utility power; the traffic control system will default to normal operating mode.

   The PIM shall enable removal and replacement of the Traffic UPS without shutting down the traffic control system (i.e. “hot swap” capability). Connectors shall be equipped with a “safety interlock” feature.

   The Traffic UPS shall provide manual on-site programming of all parameters without the use of a computer. The unit shall have a minimum of three individual contact closures for On Battery, a user selectable Timer, and a Low Battery indicator. Each contact closure shall have a Common, Normally Open, and Normally Closed contact.

   For 170 or “California” style cabinets, upon loss of power the Traffic UPS shall actuate the existing Flash Transfer Relays (FTRs) and Contactor Relay to force the traffic control system into Flash Mode operation. Existing Flasher Modules and Flash Transfer Relays shall be utilized unless these items are scheduled to be upgraded as required in Revision of Section 614 – Traffic Signal Controller Cabinet.

REVISION OF SECTION 614
TRAFFIC SIGNAL UNINTERRUPTED POWER SUPPLY

To facilitate emergency crews and police activities, the Traffic UPS shall be compatible with police panel functions (i.e. "Signals OFF" switch must kill power to the field wiring even when on UPS/Battery power).

The Traffic UPS shall be temperature rated to operate from -40ºC to +74ºC.

The Traffic UPS shall not duplicate or take over flash operation or flash transfer relay functions.

The Traffic UPS shall be capable of providing continuous, fully conditioned, regulated, sinusoidal (Alternating Current(AC)) power to selected devices such as signal controllers, Ethernet switches, terminal servers, National Transportation Communications for Intelligent Transportation Systems Protocol (NTCIP) adapters, and video equipment.

A. *Electronics Module***.** The Electronics Module shall consist of the following:
   (1) True sine wave, high frequency inverter utilizing Insulated-Gate Bipolar Transistor (IGBT) technology.
   (2) 3-stage, temperature compensated, battery charger.
   (3) For connection from the Electronics Module to the Power Interface Module and Battery System, dedicated harnesses shall be provided with quick-release, keyed and braided nylon sleeving over all conductors.
   (4) Local and remote control of UPS functions.
   (5) Local and remote communications capabilities.

   The mounting method shall be 19 inch rack-mount.

B. *Battery System.* The battery system shall be comprised of extreme temperature, deep cycle, Absorbed Glass Mat/ Valve Regulated Lead Acid (AGM/VRLA) batteries.

   Batteries shall be certified to operate from –40°C to +74°C.

   The batteries shall be provided with appropriate interconnect wiring and corrosion-resistant mounting trays or brackets appropriate for the cabinet into which they will be installed.

   The interconnect cable shall be protected with abrasion-resistant nylon sheathing. The interconnect cable shall connect to the base module via a quick-release circular connector.

   For purposes of safety and proper operation, the circular battery connector shall have interlocking pins to prevent turn-on if batteries are not connected, and to shut off the UPS should the batteries be disconnected.

   The battery system shall be certified and field proven to meet or exceed National Electrical Manufacturers Association (NEMA) temperature standards from –40°C to +74°C.

   The Traffic UPS shall include a D-Subminiature 9 Female (DB-9F) connector with open collectors (40 volts at 20 milliamperes (mA)) indicating:
   (1) Loss of Utility Power.
   (2) Inverter Failure.
   (3) Low Battery.

The UPS System shall come standard with software, Recommended Standard 232 (RS232) interface via a DB-9F connector, and Ethernet interface via RJ-45 connector allowing full, interactive, remote computer monitoring and control of the UPS functions. The software shall allow the user to set up all operational parameters either locally or remotely and test the functionality of the unit. The unit shall be capable of sending Simple Network Management Protocol (SNMP) alarm traps upon alarm conditions and also be configurable via built in web page interface.

The UPS shall be equipped with the following functions on the front panel: Power ON, Cold (Direct Current (DC)) Start, Alarm Silence, Battery Test, Bypass Breaker, and DC/Battery Breaker.

Calculated Mean Time Between Failures (MTBF) shall be 100,000 hours based on component ratings, except when Bypass and Power Interface Modules are included. When these two additional modules are included, the MTBF shall be 150,000 hours.

The system shall have a mean time to replace or repair the electronics or battery system of 15 minutes or less.

All of the above components provided, excluding the signal monitor unit, shall be on the Colorado Department of Transportation (CDOT) Approved Products list.

BASIS OF PAYMENT

Subsection 614.14 shall include the following:

Payment will be made under:

Pay Item	**Pay Unit**
Uninterrupted Power Supply	Each

REVISION OF SECTION 614
CONFLICT MONITOR

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

DESCRIPTION

Subsection 614.01 shall include the following:

This work consists of furnishing and installing a conflict monitor at Traffic Signal Controller Cabinet locations as shown on the plans.

MATERIALS

Subsection 614.08 shall include the following:

The signal monitor unit shall be a 16-channel monitor used in Advanced Traffic Controller (ATC) output files. The unit shall have the capability to monitor absence of red. The unit shall meet at a minimum all of the requirements of the Caltrans Transportation Electrical Equipment Specifications, March 2009 revised through Errata No. 2, December 2014 with basic fault coverage of Conflict, 24 Volts Direct Current (VDC), Watchdog, and Alternating Current (AC) line monitoring. The unit shall be compatible with Light Emitting Diode (LED) type signal displays. The signal monitor unit shall be capable of monitoring Flashing Yellow Arrow (FYA) as defined in the 2009 Manual of Uniform Traffic Control Devices (MUTCD). The unit shall be capable of two modes of user selectable FYA operation, standard output file or auxiliary output file. FYA configuration shall be user settable without the need for software interface. Permissive diode card modification beyond standard phase allowance shall not be acceptable. The signal monitor unit shall be provided with serial communication capability (Electronic Industries Alliance-232 (EIA-232) Port (9-pin)) and Ethernet port for diagnostic access. The signal monitor unit shall maintain a non-volatile event log of at least 100 fault events indicating the complete intersection status as well as AC line events, configuration changes, monitor resets, cabinet temperature and true root-mean-square (RMS) voltages. Each event shall be stamped with time and date. Data acquisition software shall be included with the monitor and shall be compatible with the latest Windows Operating System. Software updates shall be provided as available at no additional cost to the Colorado Department of Transportation (CDOT).

CONSTRUCTION REQUIREMENTS

Subsection 614.10 shall include the following:

Installation of the Conflict Monitor shall be in accordance with manufacturer's recommendation, unless otherwise directed.

The Contractor shall deliver the Conflict Monitors to the Region 1 Signal Shop at 18500 East Colfax Avenue, Aurora, CO 80011 for a period of up to two weeks. CDOT will conduct bench testing. The Contractor shall be responsible for picking up the Conflict Monitors at the Region 1 Signal Shop and transporting it to the installation sites shown on the plans.

The Contractor shall remove and deliver the existing conflict monitor to the Region 1 Signal Shop in working order.

METHOD OF MEASUREMENT

Subsection 614.13 shall include the following:

Conflict Monitor will be measured by the actual number of conflict monitors installed and accepted and shall include all equipment necessary for full operation. The work shall also include the removal of the existing conflict monitor.

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REVISION OF SECTION 614
CONFLICT MONITOR

BASIS OF PAYMENT

Subsection 614.14 shall include the following:

Payment will be made under:

Pay Item	**Pay Unit**
Conflict Monitor	Each

Payment will be full compensation for all labor, materials, and equipment required to complete the work.

Removal and delivery of the existing conflict monitor to CDOT will not be paid for separately but shall be included in the cost of the work.

REVISION OF SECTION 614
GROUNDING AND BONDING

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

DESCRIPTION

Subsection 614.01 shall include the following:

This work consists of grounding and bonding requirements at project locations for all Traffic or Intelligent Transportation System (ITS)-related structures, poles, service pedestals, and cabinets. The work covered in this section consists of labor, materials, and services required for a functional and unobtrusive grounding system.

(a) *General.* The Contractor shall provide comprehensive grounding and bonding for Traffic or ITS-related equipment. The Colorado Department of Transportation's (CDOT's) target resistance to ground value is equal to or less than 10 ohms.

(b) *Applicable Documents.* Work performed in this section shall comply with the most current edition of the following codes and/or standards:

(1) Institute of Electrical and Electronics Engineers (IEEE) 81 – Guide for Measuring Earth Resistivity, Ground Impedance, and Earth Surface Potentials of a Grounding System
(2) IEEE C2 – National Electrical Safety Code
(3) National Electrical Manufacturers Association (NEMA) Grounding Rod (GR) 1 – Grounding Rod Electrodes and Grounding Rod Electrode Couplings
(4) National Fire Protection Association (NFPA) 70 – National Electrical Code
(5) NFPA 70E – Standard for Electrical Safety in the Workplace
(6) NFPA 780 – Standard for the Installation of Lightning Protection Systems
(7) TIA-607 – Generic Telecommunications Bonding and Grounding (Earthing) for Customer Premises
(8) Underwriters Laboratories (UL) 96 – Lightning Protection Components
(9) UL 96A – Installation Requirements for Lightning Protection Systems
(10) UL 467 – Grounding and Bonding Equipment

MATERIALS

Subsection 614.08 shall include the following:

(a) *Components.*

1. Grounding electrodes (driven rods). Ground rods shall be provided that meet or exceed the following requirements:
   A. Preferred. Copper-clad steel ground rods (pointed) shall not be less than 5/8 inch diameter and a minimum of 8 feet in length. It shall be UL certified and have a minimum plating thickness of 10 milliinches (mils) copper cladding.
   B. Other Alternatives. Other ground rod types, such as chemical ground electrodes, may be considered based on site soil chemistry, adjacent electrically bonded structures, or if the installation must occur in a corrosive area, but must be approved by the Engineer in writing.
2. Grounding Electrode Conductor. The grounding electrode conductor shall be solid or stranded copper with a minimum size of #6 American Wire Gauge (AWG), unless otherwise specified. The Contractor shall size the grounding electrode conductor in accordance with Article 250.66 of

the National Electrical Code (NEC). Bare and insulated grounding electrode conductors shall be permitted, as approved by the Engineer. Insulated grounding electrode conductors shall be Type thermoplastic heat- and water-resistant nylon-coated (THWN) and conform to the requirements of Article 310 of the NEC. Insulated grounding electrode conductors shall utilize a green jacket color. The grounding electrode conductor run shall be installed in one continuous run without a splice or joint, except as permitted in accordance with Article 250.64(C) of the NEC.

A. For bonding between a cabinet frame and busbar, a braided ground strap shall be utilized. The braided ground strap shall consist of non-insulated tinned copper flat braid wire with a minimum width of ½ inch and a thickness of 0.07 inches (based on estimated #6 AWG equivalence).

3. Grounding Connectors. Grounding connectors shall be provided for attachment to grounding electrodes, ground bus and ground lugs. Grounding and bonding connections shall be made by means of a compression connector, a mechanical connector, or an exothermic weld. Mechanical and compression connectors shall have only one conductor installed unless designed or UL-listed for more conductors. Mechanical connections shall only be permitted when a compression or exothermic connection cannot be made.
4. Ground Bus. Provide copper bar stock grounding busbar. The minimum size shall be 1/4 inch thick by 2 inches high by 6 inches wide and positions for five lugs, unless otherwise specified by the Engineer. Hole patterns on the busbar shall accommodate two-hole lugs in accordance with Telecommunications Industry Association (TIA)-607 and hole spacing should not be less than 3/4 inch. Busbar must be wall mountable and UL certified. Stand-off brackets shall also be included and brackets shall be manufactured from 300 series stainless steel with stainless steel bolts and lock washers.

CONSTRUCTION REQUIREMENTS

Subsection 614.09 shall include the following:

(a) *General.* The Contractor shall install equipment, materials and devices in accordance with equipment manufacturer's written instructions and in compliance with applicable installation standards.

1. Connections.
   A. The Contractor shall provide exothermically welded connections below grade and in areas exposed to visible moisture.
   B. The Contractor shall provide heavy duty bolted clamped connections, UL listed, above grade and in areas where safety to personnel and structures dictate.
2. Installation.
   A. The Contractor shall install one grounding electrode. Each grounding electrode shall be installed such that at least the entire length is in contact with the soil. Where a rock bottom is encountered, the grounding electrode installation shall conform to the requirements of Article 250.53(G) of the NEC. The grounding electrode system shall be installed within CDOT right-of-way.
   B. The Contractor shall leave top of grounding electrode exposed for testing and for verifying quantities.
   C. The Contractor shall measure the resistance of the installed grounding electrode with respect to the surrounding soil using an earth ground resistance tester.
   D. If the results exceed 10 ohms, the Contractor shall install a second grounding electrode a minimum of one electrode length away from the first grounding electrode. The bonding jumper used to connect grounding electrodes shall be installed and sized in accordance

with Article 250.53(C) of the NEC.

E. The Contractor shall measure the resistance of the installed grounding electrode system with respect to the surrounding soil using an earth ground resistance tester.

F. The Contractor shall record and report results to Engineer in writing. CDOT's target resistance to ground is equal to or less than 10 ohms; however, after installing two grounding electrodes, a resistance to ground value equal to or less than 25 ohms will be accepted by CDOT. The Contractor shall be responsible for confirming the resistance to ground requirements with the various manufacturers of the equipment it procures for this project. Where manufacturers have more stringent resistance to ground requirements for operational performance and warranties, the Contractor shall be required to adhere to the manufacturer's requirements for acceptance by CDOT.

G. In the absence of low resistance soil conditions, the Engineer, at their sole discretion, may allow the use of the following: bentonite to fill the ground rod hole, chemical electrodes, or ground enhancement material. The Contractor shall obtain written permission from the Engineer prior to using the previously mentioned materials.

3. Surface Preparation.

A. Ground Bus. An abrasive pad shall be used to remove any dirt, grease, oil, and oxidation from the ground bus. A thin coating of antioxidant compound shall be applied to the connection point on the ground bus. Using stainless steel hardware, the Contractor shall tighten and torque to the value specified for the hardware grade, material, and size. Only one lug shall be installed per a two-hole mounting on a bonding surface. Lugs shall not overlap or use the same mounting holes on a bonding surface. Due to thermal cycling anticipated in the field environment, the lock washer shall be substituted with flat washers and a cupped spring washer (i.e., Belleville washer), with the cup against the head of the bolt.

B. Other Surfaces. Clean the surface thoroughly where the grounding lug is to be connected. The grounding surface shall be clean of any paint, dirt, grease, oil, rust, and other oxidation. A thin coating of antioxidant compound shall be applied to the connection point on the surface. Using stainless steel or silicon bronze hardware, the Contractor shall tighten and torque to the value specified for the hardware material and size. Lugs shall not overlap or use the same mounting holes on a bonding surface. The lock washer shall be substituted with flat washers and a cupped spring washer, with the cup against the head of the bolt.

C. Ground Attachment to Structures and Poles. The grounding electrode conductor shall be connected to the ground stud on a structure or within a pole using stainless steel nuts and cupped spring washers. The connector type for the grounding electrode conductor shall be a full circle connector sized appropriately for the diameter of the ground stud and the wire gauge of the conductor.

Where a ground stud does not exist on a structure or within a pole, the Contractor shall install a tapped and threaded hole to accommodate the grounding electrode conductor and screw. The connector type for the grounding electrode conductor shall be a full circle connector sized appropriately for the diameter of the screw and the wire gauge of the conductor. Stainless steel screws and cupped spring washers shall be included.

D. Grounding Connectors. The lug size, configuration, and material for compression connectors shall be selected based on the grounding electrode conductor size and

fastening conditions. The insulation shall be trimmed back so that the bared grounding electrode conductor is slightly longer than the barrel. After applying an antioxidant compound on the exposed grounding electrode conductor, the conductor shall be inserted so that it touches the end of the barrel as viewed through the inspection port. The Contractor shall ensure the grounding electrode conductor remains at the end of the barrel before making the first crimp nearest the tongue end and working toward the conductor with the remaining crimps. The lug manufacturer's instructions shall be followed for the number of crimps and their location on the barrel. For exothermic welds to the grounding electrode conductor, the Contractor shall select the mold and weld metal applicable to the conductor size and lug configuration. The Contractor shall clean and dry (using a torch) the grounding electrode conductor and the mold. The Contractor shall insert the conductor and lug into the mold. The Contractor shall close the handle clamp, lock the mold, and then insert the disk into the mold. The Contractor shall pour the weld metal into the mold and apply the starting material over the weld metal and on the lip of the mold. The Contractor shall close the cover and ignite using a flint igniter. After the reaction is complete, the Contractor shall wait a minimum of 15 seconds and then open the mold and remove the finished lug connection. The Contractor shall clean any slag from the finished lug connection.

4. Testing.
   A. Testing shall be performed prior to connecting to utility ground in an effort to eliminate ground loops.
   B. When the grounding electrodes are installed, they shall be measured for their effectiveness using the three-point, fall of potential method per IEEE 81 to measure the resistance of the installed grounding electrode configuration with respect to the surrounding soil using an earth ground resistance tester. The final measurement must be performed in the presence of the Engineer or CDOT's designated representative. The Contractor shall provide documentation to the Engineer of ground grid measurement results for each equipment site location tied to a single grounding system.
   C. The Contractor shall furnish its own earth ground resistance tester including stakes, clamps, cabling, transformers, and other required accessories needed to perform the testing. A copy of the earth ground resistance tester's National Institute of Standards and Technology (NIST) certification shall be provided to the Engineer as verification that the unit has been calibrated using standards and instruments traceable to international standards.

METHOD OF MEASUREMENT

Subsection 614.13 shall include the following:

Grounding and bonding will not be measured or paid for separately but will be considered subsidiary to the field device, structure, pole, service pedestal, and cabinet items, and shall include all labor, materials, equipment, testing, and documentation required to complete the work.

REVISION OF SECTION 614
GLOBAL POSITIONING SYSTEM (GPS)

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

DESCRIPTION

Subsection 614.01 shall include the following:

The Contractor shall collect geodetic data for all roadway devices installed within the project limits.

CONSTRUCTION REQUIREMENTS

Subsection 614.09 shall include the following:

The Contractor shall collect and provide electronic Global Positioning System (GPS) Coordinate information for all devices: Signal Poles and Controller Cabinet on this project. Only coordinates of devices installed on this project shall be provided.

The Contractor shall use a device designed specifically for capturing GPS coordinates.

Accuracy tolerances for data collected by the GPS unit shall be sub-meter.

The GPS coordinates shall be delivered in World Geodetic System 84 (WGS 84), latitudes and longitudes and be in decimal degree format.

For data collection, the Contractor shall use averaged waypoint at the proposed locations. Minimum averaging time at each location shall be 2 minutes (120 seconds) prior to documenting the information.

Documentation verifying the type of GPS unit being proposed for use and the specifications of the unit shall be provided to the Project Engineer for review prior to data gathering. The Contractor shall completely fill in all information for each device.

Data shall be delivered to the Project Engineer in an electronic format.

If using a GPS-collecting device with Windows CE and ArcPad, the data format deliverable shall be ArcView/ArcGIS Export/Import Format *.e00 files or ArcView/ArcGIS shape files with a minimum of three files: *.shp, *.dbf, *.shx.

METHOD OF MEASUREMENT

Subsection 614.13 shall include the following:

GPS information gathering will not be measured or paid for separately but will be considered incidental to the pay item being installed. This work shall include all labor, materials, and equipment required to complete the work.

REVISION OF SECTION 614
CONTROLLER CABINET FOUNDATION

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

CONSTRUCTION REQUIREMENTS

Subsection 614.10 (e) shall include the following:

Controller foundations shall be of a preformed type and shall meet the following requirements:

Controller foundation shall be manufactured of fiberglass reinforced polymer concrete. Foundation dimensions shall conform to the Controller Cabinet Foundation detail in the plans. A minimum of 4 – ½ inch x 13 Unified National Coarse (UNC) thread inserts shall be installed for mounting of the controller cabinet to the foundation. Placement of the mounting inserts shall match the mounting configuration of the controller cabinet. The foundation shall be provided with an opening to accommodate access of underground conduit into the controller cabinet. Foundation opening shall match the controller cabinet opening as closely as possible. A minimum of 4 – ½ inch x 13 UNC lifting inserts shall be installed at each corner of the controller cabinet foundation. Lifting inserts shall be designed to support the full weight of the foundation to aid in the moving and placing of the foundation. The walking surface of the foundation shall have a skid resistant surface.

A minimum of 12 inches of ¾ inch granite-gravel shall be installed as a base for the controller cabinet foundation. The granite-gravel shall be free of dirt and debris and spread evenly to facilitate a level base for the controller cabinet foundation. The Contractor shall ensure that sufficient compaction is made prior to the installation of granite-gravel to alleviate future settling.

A minimum of one 5/8 inch x 8 foot long copper coated steel ground rod is required at each controller cabinet foundation location. Contractor shall refer to Revision of Section 614 – Grounding and Bonding for additional information and requirements.

METHOD OF MEASUREMENT

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

The Controller Cabinet Foundation will not be measured and paid for separately, but shall be included in the Traffic Signal Controller Cabinet pay item. Traffic Signal Controller Cabinets shall include pedestal and fiberglass reinforced polymer concrete foundations as required.

REVISION OF SECTION 614
FIBER OPTIC CABLE (SINGLE-MODE)

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

This work consists of furnishing and installing single mode fiber optic cable.

Fiber optic cable shall be used for either main backbone cable or lateral cables that connect to equipment field cabinets. The main backbone cable shall be terminated in a Communications Node or Regeneration Building. Lateral fiber cables shall be terminated using fan-out kits in a termination patch panel in the field equipment cabinet.

All fiber optic cables shall be suitable for outdoor conduit installation.

MATERIALS

All fiber optic cable shall have compatible chrematistics with proposed and existing cables.

All optical cables furnished on this project shall meet the following fiber optic industry standards:

a) Electronic Industries Alliance (EIA) Telecommunications Industry Association (TIA)
b) International Organization for Standardization (ISO)
c) International Electronics Commission (IEC)
d) Telecommunication industry Association (TIA)
e) International Telecommunications Union (ITU)
f) Insulated Cable Engineers Association (ICEA)

All cables shall be new and unused non-armored outdoor cable consisting of dispersion-unshifted, low water peak single-mode fiber strands free of surface imperfections and inclusions. Each single mode fiber shall consist of a doped silica core surrounded by a concentric silica cladding. The fiber shall be of matched clad design.

(a) **Fiber Strands**

a) Typical core diameter of 8.3µmer
b) Cladding Diameter of 125.0µm
c) Core-to-Cladding Offset: $\leq$ 0.5 µm
d) Cladding Non-Circularity: $\leq$ 1 %
e) Coating Diameter (Colored): 245 ± 10 µm.
f) Maximum Attenuation (Loose Tube): 0.35 dB//km at 1310 nm wavelength and 0.22 dB/km at 1550 nm wavelength
g) Mode-Field Diameter: 9.20 ± 0.30 µm at 1310 nm wavelength and 10.40 ± 0.50 µm at 1550 nm wavelength
h) Attenuation at the Water Peak: 0.32 to 0.34 dB/km at 1383 ± 3 nm wavelength
i) Cutoff Wavelength: $\leq$ 1260 nm.
j) Zero Dispersion Wavelength: 1300nm to 1322 nm
k) Zero Dispersion Slope: 0.090 ps / ($nm^2 \bullet km$)

l) Polarization Mode Dispersion: 0.06 ps/ $\sqrt{km}$

m) Maximum Fiber Dispersion: 3.5 ps/(nm • km) for 1285 nm through 1330 nm and shall be < 18 ps/(nm • km) at 1550 nm.

n) Fiber Curl: $\geq$ 4.0 m

All optical fibers shall be proof tested by the manufacturer to a minimum load of 0.7 GN/m^2 (100 ksi).

The fibers shall not adhere to the inside of the buffer tube.

The coating shall be a dual layered, UV cured acrylate applied by the fiber manufacturer. The coating shall be capable of being mechanically stripped with a force of 0.3 – 2.0 lbf (1.3 – 8.0 N).

Each single mode fiber strand shall be color coded with distinct and recognizable colors in accordance with the most recent version of EIA/TIA-598, Optical Fiber Cable Color, as shown in the plans.

(b) **Buffer Tubes**

Each buffer tube shall contain 6 or 12 fibers as appropriate for the respective size cable.

Optical fibers shall be placed inside a loose buffer tube. The nominal outer diameter of the buffer tube shall be 3.0 mm

Each buffer tube shall be color coded with distinct and recognizable colors in accordance with the most recent version of EIA/TIA-598, Optical Fiber Cable Color, as shown in the plans.

In buffer tubes containing multiple fibers, the coloring shall be stable during temperature cycling as stated under "Fiber Specification Parameters" and shall not be subjected to fading or smearing onto each other or into the buffer tube gel filling material. Colorings shall not cause fibers to stick together.

Buffer tubes shall be of a dual-layer construction with the inner layer made of polycarbonate and the outer layer made of polyester.

Each buffer tube shall be filled with a non-hygroscopic, non-nutritive to fungus, electrically non-conductive, homogenous gel. The gel shall be free from dirt and foreign matter. The gel shall be readily removable with conventional nontoxic solvents.

Buffer tubes shall be stranded around a central member of the cable using a reverse oscillation stranding process.

The buffer tubes shall be resistant to external forces and shall meet the buffer tube cold bend and shrink requirements of EIA/TIA standards.

(c) **Fiber Cable**

Fillers may be included in the cable core to lend symmetry to the cable cross-section where needed.

The central anti-buckling member of the cable shall consist of a glass reinforced plastic rod. The purpose of the central member shall be to prevent buckling.

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REVISION OF SECTION 614
FIBER OPTIC CABLE (SINGLE-MODE)

For single layer cables, a water blocking tape shall be applied longitudinally around the outside of the strand tubes/fillers. The tape shall be held in place by a single polyester binder yarn. The water blocking tape shall be non-nutritive to fungus, electrically non-conductive homogenous. It shall also be free from dirt and foreign matter. Gel filled water-blocking compound shall not be allowed in the cable core interstices in either the backbone cable or the lateral cables.

Binders shall be applied with sufficient tension to secure the buffer tubes to the central member without crushing the buffer tubes. The binders shall be non-hygroscopic, non-wicking (or rendered so by the flooding compound), and dielectric with low shrinkage.

The cable shall contain at least one ripcord under the sheath for easy sheath removal.

Tensile strength shall be provided by high tensile strength dielectric yarns and shall be helically stranded evenly around the cable core.

Outer cable jacket shall have a consistent thickness throughout the entire cable length and shall be sheathed with medium density polyethylene, (MDPE). The minimum nominal jacket thickness shall be 1.4 mm. Jacketing material shall be applied directly over the tensile strength members and water blocking tape. The MDPE shall contain carbon black to provide ultraviolet light protection and shall not promote the growth of fungus.

The cable jacket shall be free of holes, splits and blisters.

Cable jackets shall be marked with sequential foot markings, year of manufacture and a telecommunication handset symbol, as required by Section 350G of the National Electrical Safety Code (NESC). The actual length of the cable shall be within 0 to 1% of the length markings. The marking shall be in contrasting color to the cable jacket. The height of the marking shall be easily readable.

(d) **Environmental Parameters**

a) Shipping, storage and operating temperature range of the cable as defined by Bellcore GR-12 shall be; -40°C to +75°C (-40°F to +167°F)
b) Operating temperature range of the cable as defined by Bellcore GR-12 shall be; -40°C to +70°C (-40°F to 158°F)
c) Installation temperature range of the cable as defined by Bellcore GR-12 shall be; -30°C to +60°C (-22°F to +140°F)

(e) **Quality Assurance**

a) All optical fibers shall be 100% attenuation tested. The attenuation of each fiber shall be provided with each cable reel.

b) The cable manufacturer shall be ISO 9001 registered.

(f) **Packaging**

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REVISION OF SECTION 614
FIBER OPTIC CABLE (SINGLE-MODE)

a) The complete cable shall be packaged for shipment on non-returnable wooden reels.

b) Top and bottom ends of the cable shall be available for testing.

c) Both ends of the cable shall be sealed to prevent the ingress of moisture.

d) Each reel shall have a weatherproof reel tag attached identifying the reel and cable.

e) Each cable shall be accompanied by a cable data sheet that contains significant information on the cable.

The Contractor shall provide the Engineer with two copies of the cable manufacturer's installation instructions for all fiber optic cable. All installations shall be in accordance with the manufacturer's recommendations except as otherwise directed by the Engineer. All additional costs including fiber optic cable associated to damages caused by the Contractor's neglect of recommended procedures shall be the Contractor's responsibility.

The Contractor shall submit a Method Statement to the Engineer indicating cable routing, splice points and cable end splicing locations. Installation of the cable will not be permitted until the schematic diagram has been approved by the Engineer.

Fiber optic cable including both backbone cables and lateral cables shall be installed in continuous runs. Under no conditions shall fiber optic cable be cut or spliced at intermediate points without express written direction from the Engineer.

Blowing cable is an acceptable alternative to pulling cable. If the Contractor chooses to use this method, submittals for cable installation shall be submitted along with complete information on fiber installation equipment.

The maximum pulling tension shall be 2700 N (600 lbs) during installation (short term) and 890 N (200 lbs) long term installed.

All cables shall have a minimum bending radius based on the diameter of the cable and shall meet the following;

a) Pulled under tension, (Short Term) – 20 (Twenty times the cable diameter)
b) Pulled not under tension, (Long Term) – 10 (Ten times the cable diameter)

The fiber optic cable shall be installed in the conduit with a split-mesh cable grip to provide a firm hold on the exterior covering of the cable.

The manufacturer's recommended limits for cable pull lengths shall not be exceeded. The Contractor shall use a pulley system with a numerical readout indicating the cable tension. The pulley system shall be capable of alerting the installer when the cable pulling tension approaches the manufacturer's maximum allowable tension. The Contractor may supplement this procedure with a breakaway tension limiter set below the lowest recommended tensile limit of the cables being pulled. Intermediate pulleys shall be used at all pull boxes or manholes along the installation run to prevent cable damage.

If cable installation limits are met and the entire length cannot be installed completely from the shipping reel, installation shall be continued from the mid-point of the run. The Contractor shall first pull one-half of the cable from the reel at the mid-point through the conduit to one end of the run. The other half of the cable shall be removed from

the reel and carefully placed on the ground in a figure eight pattern with a minimum loop diameter of 10 feet. While installing the remaining cable, care shall be taken to avoid any dragging against the ground resulting in damage or excess bending of the cable. The Contractor shall not kink, twist or bend the cable during installation coiling or uncoiling.

The cable shall be continuously lubricated as it enters the conduit. The Contractor shall only use pulling lubricants recommended by the cable manufacturer. Liquid detergent shall not be used.

If the Contractor must install new cable in conduits which contain existing fiber or electrical wiring, the Contractor shall be responsible for any damage to the existing cables or wires. After this installation the Contractor shall perform a functional test of all the equipment connected by the existing fiber cables or electrical wiring to ensure proper working conditions.

If an existing fiber optic cable is damaged during construction, it shall be removed from both points of termination and replaced, at no cost to the project. In no case shall the fill of any new conduit exceed the requirements of the National Electrical Code. The Contractor shall provide documentation to the Engineer supporting the conduit fill. All costs associated with equipment testing and repairs shall be included in the cost of the Fiber Optic Cable.

Lateral cables shall be installed in continuous runs from the backbone splice location to the field equipment cabinet. Odd length cables and reel ends are acceptable for lateral cables provided they are pre-tested and free of defects and are of sufficient lengths to archive continuous runs.

Lateral cables shall have slack and include a maximum of three locations of appropriate strain relief within all field equipment cabinets.

All fiber optic cables shall include identification labels attached to the cable in each pull box, manhole or field equipment cabinet. The label shall be provided with information as shown on the Project Detail Sheet.

The Contractor shall splice fiber cables at locations shown on the plans. All splices shall be enclosed within a splice closure as approved by the Engineer. Following successful splicing, the splice closure shall be placed inside the pull box or manhole. The Contractor shall use tools and hardware recommended by the cable manufacturer.

Only proposed active (lit) fibers shall be spliced in the closure and terminated in the field communications cabinet. All unused (dark) fibers of both the backbone and lateral cables shall remain uncut and be neatly coiled in the splice tray within the closure. All unused buffer tubes shall remain uncut and neatly coiled along with the buffer tubes used for splicing in appropriate location in the splice closure.

Backbone and lateral buffer tubes and fiber strands shall be labeled on the splice tray prior to sealing of the closure as shown on the Project Detail Sheet.

The Contractor shall coil 100 feet of backbone cable in the manholes. The Contractor shall coil 50 feet of backbone cable in pull boxes.

The Contractor shall coil 50 feet of lateral cable in the manholes. The Contractor shall coil 25 feet of Lateral cable in pull boxes.

The Contractor shall ensure that all cable coils and splice canisters are attached to the cable management hardware in all pull boxes and manholes.

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REVISION OF SECTION 614
FIBER OPTIC CABLE (SINGLE-MODE)

The Contractor shall terminate the lateral cable at the field equipment cabinet using a buffer tube fan-out kit. Fanned-out fiber strands shall be terminated in a termination block with ST connectors.

The Contractor shall submit a final documentation package. The final documentation package shall include the cable manufacturer's installation procedures, technical support documentation and material documentation. These documents shall match the original submittals provided to the Engineer.

Fiber Optic Cable shall be measured by the Linear Foot for both backbone and lateral cable and shall include all labor and materials required to install, splice and terminate the cable to make a complete and operational system and shall include the following items:

1. All required splicing, splice closures, splice kits, hardware, splicing tools and labor to accomplish the splices.
2. All required termination panels in field equipment cabinets.
3. All required fan-out kits, hardware and labor to accomplish fan-out.
4. All required termination connectors, adapters, jumpers, pigtails, hardware and labor required to accomplish lateral cable terminations.
5. Identification labels for both backbone and lateral fiber cables in each pull box, manhole and field equipment cabinet.
6. As Built Documentation

METHOD OF PAYMENT

Payment for Fiber Optic Cable will be made according to the following schedule:

50% upon completion of cable installation

50% upon the review and acceptance of all fiber test results showing the conformance to this specification and the 614 Test Fiber Optic Cable Specification included in this plan package.

Payment will be made under:

Pay Item	***Pay Unit***
Fiber Optic Cable (Single-Mode) (12 Fiber)	Linear Foot

Testing Fiber Optic Cable will be measured and paid for separately. See 614 Test Fiber Optic Cable specification included in this plan package

REVISION OF SECTION 614
FIBER OPTIC TERMINATION PANEL

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

DESCRIPTION

This work consists of furnishing and installing fiber optic termination panels in communication cabinets for single mode fiber optic cables.

MATERIALS

All termination panels shall be manufactured using aluminum and shall be finished with powder coat. The termination panels shall accommodate lateral fiber optic cables as shown on the plans. All termination panels shall be equipped with six port Straight Tip (ST) type bulkheads and be compliant with the Telcordia Technologies Generic Requirement (GR) GR-326 *Generic Requirements for Single-Mode Optical Connectors and Jumper Assemblies, Latest Issue*. The manufacturer shall perform acceptance testing for insertion loss and return loss with the test certification provided with each patch panel.

All termination panels shall have a labeling scheme that complies with details as shown on the plans.

All termination panels shall be compatible with the fiber optic cable being terminated.

The six port panels shall have hinged doors that provide access to both the fiber fan out and the termination bulkheads. The panel shall be sized to accommodate the entry of the lateral fiber optic cable, fiber fan out, and bulkheads with the access door closed. The fiber optic patch panel shall be suitable for wall mounting. Dimensions shall not exceed 5 inches wide × 6 inches long × 2 inch deep. Each fiber optic patch panel shall include a fiber adapter panel, adapters, fiber pig tails, strain relief, grommet tape, zip ties, cable management hardware for fiber strands and fan out kit buffer tubes, and wall mounting bracket. Terminations within the patch panel shall be polished with a physical contact (PC) finish.

24 port termination panels for lateral fiber optic cables shall be provided to accommodate 24 adaptor ports. 24 port termination panels shall be compatible with a 19-inch equipment rack. The panels shall be provided with two six port adaptor panels with ST type adaptors. The panel shall be provided with covers for the remaining adaptor port slots. The termination panel shall have a slide out interior to allow easy access to the interior of the termination panel for future maintenance.

Adaptor panels in all termination panels shall be metal. Plastic adaptor panels will not be accepted.

CONSTRUCTION REQUIREMENTS

Six port termination panels for lateral fiber optic cables shall be installed at locations where either existing or proposed equipment does not allow for the installation of a 24 port termination panel.

24 port termination panels shall be installed within communications cabinets and shall be mounted in locations that allow for ease of access and shall not interfere with maintenance of the internal equipment. 24 port termination panels shall be installed in communications cabinet 19 inch equipment racks.

Fiber terminations shall be as shown on the plans. The contractor shall terminate all of fibers in the specified cable or the maximum allowed by the specified termination panel. The contractor shall field terminate ST type bulkhead connectors on the ends of the lateral fiber cable strands and install them on the back side of the termination panel. The terminated connectors shall be nickel-plated with a ceramic ferrule and shall be polished with a physical contact finish. Buffer tube fan-out kits shall be paid for in accordance with the Revision of Section 614 – Buffer Tube Fan-Out Kit.

REVISION OF SECTION 614
FIBER OPTIC TERMINATION PANEL

The Contractor shall use a single mode fiber pigtail buffer tube that is factory terminated on six port ST type bulkhead and fusion splice the pigtail to the lateral fiber optic cable. The termination panel shall be sized and configured to accommodate splicing of the pigtail and shall include a splicing chip attached to the back of the patch panel to hold all individual splices.

The Contractor shall use proper strain relief and cable management inside the termination panel for the fiber cable and fiber fan out strands per the manufacturer's recommendations. The use of tape to secure the individual fanned out strands to the bottom of the termination panel shall not be allowed. In 24 fiber termination panels, the contractor shall allow enough slack in the terminated fiber to allow for opening and closing the termination panel without disturbing the terminated fiber.

All hardware shall be installed in accordance with manufacturer's recommendations.

METHOD OF MEASUREMENT

Fiber Optic Termination Panels will be measured by the actual number of fiber optic termination panels installed and accepted and shall include all bulkheads, field terminations, covers for empty bulkhead entries, labeling panels and all materials, hardware, labor and equipment necessary to complete the work.

BASIS OF PAYMENT

Payment will be made under:

Pay Item	Pay Unit
Fiber Optic Termination Panel – 12 Fiber	Each

REVISION OF SECTION 614
BUFFER TUBE FAN OUT KIT

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

DESCRIPTION

For this project, the Buffer Tube Fan Out Kit shall be furnished and installed on single mode fiber optic lateral cable ends in field communications cabinets.

MATERIALS

Buffer Tube Fan Out Kits shall match the number of fiber strands in the lateral fiber optic cable. Buffer tube fan-out kits shall be compatible with the fiber optic cable being terminated and shall be color-coded to match the lateral fiber strand color. Fan out kit buffer tubes shall be 900 um. The buffer tube fan out kit fiber strand length shall be sufficient for routing and placement in the termination panel. All components of the fan-out kit shall be rated for outdoor use.

CONSTRUCTION REQUIREMENTS

The Contractor shall install fiber optic buffer tube fan out kits on the lateral cable in each communications cabinet. The Contractor shall install fanned out cables on the ends of lateral fiber cable strands. Buffer tubes for lateral fiber strands shall be neatly coiled and secured within the field termination panels. Taping or leaving the buffer tubes unmanaged shall not be allowed.

METHOD OF MEASUREMENT

Buffer Tube Fan Out Kit will be measured by the actual number of buffer tube fan-out kits installed, terminated, and accepted.

BASIS OF PAYMENT

Payment will be made under:

Pay Item	**Pay Unit**
Buffer Tube Fan Out Kit	Each

Payment will be full compensation for all labor, materials and equipment required to complete the work.

Termination of lateral fiber optic cable is paid for in accordance with Revision of Section 614 – Fiber Optic Termination Panel.

REVISION OF SECTION 614
TEST FIBER OPTIC CABLE

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

DESCRIPTION

Test Fiber Optic Cable shall include Optical Time Domain Reflectometer (OTDR) tests, Coarse Wave Division Multiplexor (CWDM) OTDR tests, spectrum analysis of CWDM fiber, and optical power meter tests of all installed fiber and modified existing fiber on the project.

MATERIALS

The Contractor shall use equipment that is calibrated biennially. A copy of the most recent certificate of calibration and all out-of-tolerance conditions shall be provided to the Project Engineer prior to the initiation of testing activities. The following equipment and information is required to perform fiber optic cable tests:

(1) an OTDR (submit certification to Project Engineer)

(2) A Coarse Wave Division Multiplexor OTDR (submit certification to Project Engineer)

(3) An optical spectrum analyzer (submit certification to Project Engineer)

(4) Optical Power Meter Equipment capable of measuring optical power in dBm (submit certification to Project Engineer)

(5) a launch box (min length – 1000 feet)

(6) a light source at the appropriate wavelength

(7) Test jumpers shall be 3 feet to 12 feet long with connectors that are compatible with the light source and power meter and shall have the same fiber construction as the link segment being tested.

CONSTRUCTION REQUIREMENTS

Prior to splicing and testing on the project the Contractor shall submit a detailed Method Statement to the Project Engineer describing the splicing plan and testing schedule and methods. No fiber optic splicing shall begin until the Method Statement is submitted and approved. Once the splicing and testing begins, the Method Statement shall be updated if necessary to address any required changes in the original planned and approved procedures.

The contractor shall conduct fiber optic testing at the following stages:

(1) Pre-installation testing – bi-directional OTDR test of every fiber on every reel after delivery of the reel
(2) Post installation and pre-splicing test – bi-directional OTDR test of every fiber of every cable after fiber is installed in the ground
(3) Post-splicing tests, pre-CWDM filter splicing tests
   i) Optical Power meter test from all fiber terminated in communications cabinets to a network facility for all fiber that is not used for CWDM on the project.
   ii) Bi-directional OTDR test of all fiber between termination point in a network facility and cable end and between termination point in a network facility and communications cabinets for fiber that is not used for CWDM on the project
   iii) Bi-directional CWDM OTDR test of all fiber between termination point in a network facility and cable end and between termination point in a network facility and communications cabinets for all fiber that is used for CWDM on the project
(4) Post-CWDM filter splicing tests
   i) Spectrum analysis of all terminated fiber used for CWDM after filters have been spliced
   ii) CWDM-OTDR

iii) Optical Power meter test

(5) Re-testing of all stages above if initial test fails and after corrective action is taken

The guidelines for fiber optic cable testing include:

(1) Launch box and test jumpers must be of the same fiber core size and connector type as the cable system: Single mode fiber 9.0µm (nominal) /125 µm
(2) The light source and OTDR must operate within the range of 1310±10 nm and 1550±20 nm single mode nominal wavelength for testing in accordance with Telecommunications Industry Association (TIA) TIA-526-7 Measurement of Optical Power Loss of Installed Single-Mode Fiber Cable Plant.
(3) The power meter and the light source must be set to the same wavelength during testing.
(4) The OTDR and power meter must be calibrated at each of the nominal test wavelengths and traceable to the National Institute for Standards and Technology (NIST) calibration standards.
(5) The calibration of the OTDR and power meter shall conform to the requirements set forth in Telecommunications Industry Association/Electronic Industries Alliance (TIA/EIA) TIA/EIA-455-226 Calibration of Optical Time-Domain Reflectometers and TIA-455-231 Calibration of Fiber Optic Power Meters, respectively.

The contractor shall document jacket length measurements for lateral and backbone cable at each end including splice enclosures and patch panels.

The Contractor shall document bare fiber slack not accounted for in jacket length.

All system connectors, adapters and jumpers shall be cleaned per manufacturer's instructions before measurements are taken.

At locations of new lateral fiber optic cable installation and at locations that require the re-installation of existing lateral fiber optic cable, the Contractor shall conduct testing from the termination panel mounted in the communications cabinet to the splicing manhole. The bi-directional test shall be conducted from the termination panel towards the splicing manhole and from the splicing manhole to the communications cabinet termination panel.

Final splicing will not begin until such time that the Contractor submits OTDR test results to the Project Engineer and the Project Engineer reviews the results.

Final OTDR testing from the communications cabinet to the corresponding traffic management system building shall be conducted after their splicing work has been completed. All issues with communications related to Contractor installation and workmanship shall be remediated by the Contractor at no additional cost to the project.

A functional test shall be made in which it is shown that each and every part of the system functions as specified or intended herein.

Optical Fiber Cable Testing with OTDR

The Contractor shall perform an OTDR test of all fibers in all tubes on the reel prior to installation of the fiber. The test results shall be supplied to the Project Engineer prior to installation of the cable.

Fiber testing shall be performed on all terminated fibers from patch panel to patch panel and unterminated fibers from end to end. Additionally, mid entry splices into mainline cables require testing of all strands in the mainline cable before and after installation. Testing shall consist of a bi-directional end-to-end OTDR trace.

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REVISION OF SECTION 614
TEST FIBER OPTIC CABLE

Loss numbers for the installed link shall be calculated by taking the sum of the bi-directional measurements and dividing that sum by two.

The Contractor shall use an OTDR that is capable of storing traces electronically and shall save each final trace.

The Contractor shall use a test reel of minimum length identified in the Materials section of this Special Provision. The Contractor shall indicate the length of the test reel, in feet, for all test results.

If the fiber designation is not indicated on the trace itself, the Contractor shall provide a cross-reference table between the stored trace file name and the fiber designation.

The Contractor shall record the following information during the test procedure:

(1) Name and contact information of person conducting the test
(2) Type of test equipment used (manufacturer, model, serial number, calibration date and valid certification of calibration)
(3) Date test is being performed
(4) Optical source wavelength and spectral width
(5) Fiber identification
(6) Start and end point locations
(7) Test direction
(8) Launch conditions
(9) Method of calculation for the attenuation or attenuation coefficient
(10) Acceptable link attenuation
(11) Cable manufacturer stated index of refraction for cable being tested
(12) Jacket readings in and out of each splice vault and each pull box

Optical Fiber Cable Testing with Optical Power Meter

The Contractor shall conduct an Optical Power Meter Test of each fiber installed.

Single mode segments shall be tested in one direction at both the 1310 nm and 1550 nm wavelength.

The following information shall be recorded during the test procedure:

(1) Names of personnel conducting the test
(2) Type of test equipment used (manufacturer, model, serial number, calibration date and a valid certification of calibration)
(3) Date test is being performed
(4) Optical source wavelength and spectral width
(5) Fiber identification
(6) Start and end point locations
(7) Test direction
(8) Reference power measurement (when not using a power meter with a Relative Power Measurement Mode)
(9) Measured attenuation of the link segment
(10) Acceptable link attenuation

Acceptable Attenuation Values

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REVISION OF SECTION 614
TEST FIBER OPTIC CABLE

The Contractor shall calculate acceptable attenuation values for each fiber tested. These values represent the maximum acceptable test values.

The general attenuation equation for all single mode link segments is as follows:

Acceptable Link Attenuation = Cable Attenuation + Connector Attenuation + Splice Attenuation.

8.3 µm (nominal) Single-mode Attenuation Coefficients:

(1) Cable Attenuation=Cable Length (km) x (0.35 dB/km at1310 nm and 0.22 dB/km at1550 nm)
(2) (No. of Mated Connections x 0.50 dB)
(3) Splice Attenuation = Splices x 0.30 dB

Test Procedures

The single mode Optical Power Meter fiber test shall be conducted in accordance with TIA-526-7.

The single mode OTDR test shall be conducted in accordance with TIA-526-7.

Testing for CWDM single wavelength filters (CWDM filter) shall be conducted in the following manner to ensure that the filter Pass, Reflect and Common pigtails are spliced to proper lateral fiber strands. Testing procedures and CWDM data flow information is included on the plans. Testing shall be conducted for all CWDM wavelengths applicable to each fiber strand used for data communications. CWDM wavelengths on this project include 1430 nm, 1450 nm, 1470 nm, 1490 nm, 1510 nm, 1530 nm, 1570 nm, 1590 nm, and 1610 nm. Industry standard wavelengths (e.g. 1430 nm = 1431 nm) shall be observed.

After completion of fiber optic cable installation and prior to the CWDM filter splicing, all backbone cable to lateral cable splices shall be completed in the individual Ethernet switch sub-rings. Required steps shall include:

(1) The backbone end of Lateral Cable 1 shall be spliced to the fiber optic backbone cable in Splice Closure 1. Once this splice is complete no future access to Splice Closure 1 shall be made unless a re-splice is required.
(2) The opposite end of Lateral Cable 1 shall be spliced to itself in Splice Closure 2 in a manner to achieve continuity in the backbone strands from the beginning of the sub-ring (first traffic management system building) to the far end of the sub-ring (next traffic management system building).
(3) An OTDR test shall be conducted on the sub-ring from building to building to ensure proper splicing of Lateral Cable 1 in Splice Closure 1.

Once the OTDR test is complete the results shall be submitted to the Project Engineer for approval. After approval the splicing of CWDM filters in Splice Closure 2 may begin.

The Contractor shall be required to break the Lateral Cable 1 splices in Splice Closure 2 used in the continuity test and conduct the CWDM filter splicing per the project fiber splice plans. This will include splicing of Lateral Cable 1 and Lateral Cable 2 in Splice Closure 2 and the termination of Lateral Cable 2 in the communications cabinet.

After CWDM filter splicing, the Contractor may use one of the following methods to ensure the proper CWDM filter splicing.

(1) By using a fiber identifier, testing of the incoming signal from either the upstream or downstream CWDM location, the Contractor shall show the Project Engineer that proper CWDM filter pigtail splicing has been achieved.

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REVISION OF SECTION 614
TEST FIBER OPTIC CABLE

(2) By using a spectrum analyzer to test the incoming wavelength to ensure proper splicing and wavelength of the CWDM signal.

Once all splicing of the individual sub-ring is complete the Contractor shall conduct the CWDM-OTDR and spectrum analyzer testing and submit the results to the Project Engineer. At the acceptance of these tests, the Contractor shall determine the proper optical attenuator to install at both the communications termination panel and the communications node building termination panel. After installation one final test of optical power shall be conducted to determine if the proper signal strength is being achieved by the Ethernet switch CWDM optic.

At that point the Colorado Department of Transportation, Colorado Transportation Management Center personnel along with Ciena network engineers will configure the sub-ring into the overall CDOT ITS network. If network communications cannot be achieved, a review of the CWDM testing materials will be begin.

Test Acceptance

The Contractor shall demonstrate that the tests result in acceptable attenuation values.

The Contractor, solely at the Contractor's expense, shall re-splice all fusion splices and re-terminate all terminations that have test results exceeding acceptable attenuation values. The Contractor, solely at the Contractor's expense, shall retest all fiber links that have been re-spliced and shall retest all fiber links that have been re-terminated.

The Contractor, solely at the Contractor's expense, shall bring all links not meeting the requirements of this specification into compliance.

Submittals

The Contractor shall submit test result documentation as an electronic copy.

After each reel test, the Contractor shall submit one electronic copy of the OTDR trace for every fiber on the reel.

After installation, the Contractor shall submit one electronic copy of the following tests:

(1) Continuity OTDR trace for every spliced fiber which the CWDM optical network will utilize.
(2) OTDR trace for every fiber the high speed DWDM optical network will utilize.
(3) CWDM-OTDR trace for every fiber which the CWDM optical network will utilize.
(4) Spectrum analyzer test results for every fiber which the CWDM optical network will utilize.
(5) OTDR traces and power meter results for all "dark" unused fiber strands in the backbone fiber optic cable from traffic management system buildings.

The Contractor shall submit electronic copy of all traces (pdf and native file format) and appropriate software, if needed, to allow reading the traces.

The Contractor shall submit one copy of the complete contract Plans, including additional drawings issued as part of all change orders, with all deviations clearly marked in color. Deviations to be noted shall include at a minimum, but not be limited to, the following:

(1) Fiber Splice location
(2) Fiber Splice configuration
(3) Termination layout

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REVISION OF SECTION 614
TEST FIBER OPTIC CABLE

METHOD OF MEASUREMENT

Testing of fiber optic cable will be measured by all fiber optic testing, retesting, including all labor, materials, and document submittals necessary to complete the work.

BASIS OF PAYMENT

Payment will be made under:

Pay Item:	**Pay Unit:**
Test Fiber Optic Cable	Lump Sum

Payment will be full compensation for all labor, materials and equipment required to complete the work.

REVISION OF SECTION 614
SFP OPTIC MODULE

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

DESCRIPTION

For this project, the SFP Optic Module shall be a single wavelength, dual fiber extended temperature range, single mode SFP optic module for installation in a Ciena 3930 or 3931 Carrier Ethernet SDS. All SFP optic modules shall be provided from a manufacturer compatible with Ciena.

MATERIALS

The Contractor shall furnish and install the SFP optic modules in the wavelengths as shown in the item table below. This table describes optic modules for installation in Ciena 3930 or 3931 Carrier Ethernet SDS Ethernet switches

Item Table – SFP Optic Modules for Ciena 3930/3931 Carrier Ethernet SDS switches.

ITEM DESCRIPTION	ITEM NUMBER
100M/1 GIG, SM SFP Optic, LC Connector, 10 KM, 1310 NM, Ext. Temp	XCVR-A10Y31
100M/1 GIG, SM SFP Optic, LC Connector, 40 KM, 1310 NM, Ext. Temp	XCVR-A40Y31

If for any reason the SFP optic modules are defective or are damaged at the time of installation by either the Contractor or by Ciena, the optic module shall be removed and replaced at no additional cost to the project. SFP optic modules shall also be replaced if any failures occur due to manufacturer's defect, at no additional cost to the project, prior to the final network acceptance.

Neither the Ciena distributor nor Ciena Corporation has been involved in the design of the project network. The Contractor shall contact the Ciena distributor representative for equipment quotations and purchasing purposes only. The Contractor shall not contact or rely on either the Ciena distributor or Ciena for network design related questions.

When requesting quotations, the Contractor shall submit to the Ciena distributor a complete package including the following items:

- A complete list of required equipment for purchase including materials and quantities based on the individual pay item project specifications including those stated under the Method of Measurement section of the specification to achieve a complete item(s) installation per the project plans.
- A PDF copy of all project specifications pertaining to the material being ordered.
- A PDF copy of all networking project plan sheets.

It is the Contractor's responsibility to provide the distributer's representative all information required pertaining to the complete network design as shown in the project plans. During the bidding process, the Ciena distributor or Ciena Corporation is not responsible for any type of network design aide. All questions pertaining to the design shall be through the Project Engineer for help or clarification.

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REVISION OF SECTION 614
SFP OPTIC MODULE

CONSTRUCTION REQUIREMENTS

For Ciena 3930/3931 Carrier Ethernet SDS switch installations, two SFP optic modules shall be installed in each switch for data communications.

The Contractor shall ensure that the wavelengths of the SFP optic modules installed in the Ciena 3930/3931 Carrier Ethernet SDS Ethernet switches match those installed in the corresponding existing Ciena 5150 and/or proposed Ciena 5142 Carrier Ethernet SAS Ethernet switch to ensure proper data communications, as directed by the Engineer.

METHOD OF MEASUREMENT

SFP Optic Modules for the Ciena 3930 or 3931 Carrier Ethernet SDS switches, will be measured and paid for by the actual number installed and accepted for a complete installation.

BASIS OF PAYMENT

Payment will be made under:

Pay Item	**Pay Unit**
1310nm SFP Optic Module	Each

Payment will be full compensation for all labor, materials and equipment required to complete the work.

REVISION OF SECTION 626
PUBLIC INFORMATION MANAGEMENT
(TIER IV)

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

DESCRIPTION

This work consists of providing Public Information Management for the duration of the project. The Contractor shall submit all documentation associated with the Public Information Management item to the Project Engineer. Before approval, the Engineer will coordinate review and approval with the Region Communications Manager (RCM).

Anticipated communications issues on this project include:

- No communications issues are expected.

CONSTRUCTION REQUIREMENTS

(a) *Public Information Manager (PIM)*. The PIM shall perform all activities associated with Public Information Management for this project. In the event the PIM is not available, the Backup PIM shall perform the required activities. Within ten days of the Notice to Proceed date or five days before the Pre-construction Conference, whichever is later, and at least 14 days before starting PIM work, the Contractor shall submit the name, contact information, and resume of the PIM and the Backup PIM to the Engineer. The PIM and Backup PIM shall have a minimum of five years of professional experience in public or media relations, marketing, or other related field and appropriate verbal and written communication skills. Experience in administrative or business office duties is not a related field.

(b) *Activities of the PIM.* The PIM duties are:

(1) *Project Onboarding/Offboarding Request Form.* The PIM shall complete and update the Project Onboarding/Offboarding Request Form (https://form.jotform.com/71167524405150)every month or as requested by the Engineer. The form will assist the PIM and CDOT with tracking required activities and deliverables.

(2) *On-Call.* The PIM shall be available or on-call each day there is work on the project and shall be available upon the Engineer's request outside of normal working hours. The PIM and the Contractor shall participate with CDOT on all meetings requested by the Engineer.

(3) *Public Information Office.* The Contractor shall establish a public information office equipped with a telephone, a local telephone number with voicemail, which becomes the Project Hotline, a computer, and an email address. Acceptable locations for the project's public information office include the project office or off-site within the Contractor's office or the PIM's office. The Project Information signs shall include the Project Hotline telephone number. The PIM shall update the Project Hotline telephone message greeting weekly at a minimum and include the project's anticipated completion date and forthcoming activities for the update period. The PIM shall answer calls, listen to voicemail, and check email throughout each day that construction operations are in effect. The PIM, and when necessary, the Engineer, shall respond to all inquiries with a phone call, a voicemail message, or an email within one day. The PIM shall document the contact's name, contact phone number or email address, and the action taken. Within two days of receiving the message, the PIM shall enter message details and follow-up action into the electronic reporting system.

(4) *Project Meetings.* The PIM shall participate in the weekly project meetings, discuss communication issues, and provide a status on the items in this specification.

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REVISION OF SECTION 626
PUBLIC INFORMATION MANAGEMENT
(TIER IV)

(5) *Lane Closure Reporting.*

(i) *Electronic Reporting System.* Before the Pre-construction Conference and at least 14 days before the project start, the PIM shall submit a request for access to the electronic reporting system through the Project Onboarding/Offboarding Request Form (b.1). At least once per week, the PIM shall enter project information into the electronic reporting system.

(ii) *Weekly Lane Closures.* The Superintendent or PIM shall notify the Engineer one week in advance of all planned "no work" periods and planned lane closures. The PIM shall enter the planned weekly lane closures and updates into the electronic reporting system for the upcoming work period, Sunday through Saturday, by Thursday at 12:00 P.M. The Engineer will approve the Lane Closure and Updates by Friday at 3:00 P.M. Each Monday by 12:00 P.M., the PIM shall review www.cotrip.org and verify that the lane closure and update information is accurate. If corrections are necessary, the PIM shall coordinate with the Engineer to make necessary corrections to www.cotrip.org.

(iii) *Real-Time Lane Closure Changes.* The Superintendent shall notify the PIM and the Engineer at least 24 hours in advance on approved Lane Closure changes. The Engineer will notify the PIM when the electronic reporting system is available for changes. After completing the changes, the PIM shall notify the Engineer that the changes are ready for review and approval.

(6) *Public Information Collateral.* The PIM shall develop a variety of Public Information Collateral to share project information for project milestones such as long-term closures or impactful construction activities. Collateral includes the following:

(i) *Photographs and Video Recordings.* The PIM shall take digital photographs and video recordings at regular intervals and submit them to the Engineer. The PIM may use a cell phone camera. Photographs and video recordings shall capture various work activities and other areas of work as identified by the Contractor or the Engineer. Public Information Collateral shall include these photographs and video recordings. The PIM shall submit a minimum of two digital photographs or video recordings of the project activities and progress each month. Each photograph and video recording shall include the project number, project code, date, time, location and station or milepost, and name of the person taking the photograph or video recording.

(ii) *Maps and Graphics.* The PIM shall develop maps, detour maps, and graphics for use in Public Information Collateral.

(iii) *Web Page Updates.* The PIM shall work with CDOT to develop the latest project information for the internet web page content. The PIM shall supply information for the web page using the CDOT web page template in the Project Onboarding/Offboarding Request Form PIM resources. When applicable, the updates shall contain all appropriate web page links to and from other sites. The PIM shall provide updated information at least weekly. In addition, CDOT will update the web page.

(iv) *Stakeholder List.* The PIM shall submit a Stakeholder List as a component of the Public Information Plan with each stakeholder's name, telephone number, email address, and notes on communication needs for the project.

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REVISION OF SECTION 626
PUBLIC INFORMATION MANAGEMENT
(TIER IV)

(v) *Public Information Management Contact Sheet.* The PIM shall prepare and update a Public Information Management Contact Sheet with the names and contact information of the individuals pertinent to the project's public information. At a minimum, the Contact Sheet shall include the Resident Engineer, Project Engineer, RCM, CDOT website administrator, the electronic reporting system administrator, PIM, Backup PIM, Contractor Superintendent, and Traffic Control Supervisor. The contact sheet shall include the applicable Traffic Management Centers. (Joint Operations Center-Golden, Joint Operations Area-Eisenhower Johnson Memorial Tunnel, Joint Operations Center-Pueblo, and Joint Operations Center-Hanging Lake Tunnels.) The Public Information Plan shall include the Public Information Management Contact Sheet.

(vi) *Traffic Advisories and Project Updates*. The PIM shall develop weekly traffic advisories and project updates developed from the weekly Lane Closure Report, including lane closures and project update information. The CDOT traffic advisories and project updates templates are available in the Project Onboarding/Offboarding Request Form PIM resources. The Engineer will approve traffic advisories and project updates before distribution. The PIM shall email the traffic advisory and project updates to the stakeholder list by Friday of each week to announce the following week's upcoming project activity. The emailed advisory may come from the project email box or an automated distribution platform. A Mailchimp account is available through CDOT.

(vii) *Media Relations.* At least 14 days before the start of work or a milestone, the PIM shall prepare media releases using the CDOT media release template available in the Project Onboarding/ Offboarding Request Form PIM resources. The PIM shall allow the Engineer at least three days to review and approve the media release before distribution. CDOT will distribute media releases.

CDOT will address all media inquiries and media requests. The PIM shall immediately notify the Engineer of any project and on-site situations involving the media. When the media contacts the PIM or Contractor staff, the PIM shall provide the media the RCM's contact information.

The PIM shall prepare a media release announcing the project, summarizing the project scope, construction phasing, construction activities that affect traffic, the project end date, and a summary of project benefits. The PIM shall develop additional media releases for major construction milestones, traffic control or lane shifts, closures, project completion, and as directed by CDOT. The releases shall also include maps or other graphics.

(7) *Public Information Plan.* The PIM shall submit a Public Information Plan (PIP) within five days of the Pre-construction Conference. The PIP shall be specific to the project. The PIP shall include public information strategies for affected road users using the Public Information Collateral, the expected work zone impacts and closure details, commuter alternatives, community, government and business relations, media relations, identification of public information issues, proposed outreach strategies, approach to crisis communications, the Stakeholder List, and the Public Information Management Contact Sheet. The PIM shall update the plan when necessary and as directed by the Engineer. The PIP is a component of subsection 630.10 Transportation Management Plan.

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REVISION OF SECTION 626
PUBLIC INFORMATION MANAGEMENT
(TIER IV)

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

Table 626-1 - Response Timing

Type	Timing
Project Hotline calls and voice messages	Answer calls and check messages throughout each day. Respond within one day. Enter details into the electronic reporting system within two days.
Email messages	Respond within one day. For high-volume situations, respond within two days. Enter details into the electronic reporting system within two days.
Calls from CDOT Staff	Respond as soon as possible and within 24 hours.
Web page inquiries	Respond within one day. For high-volume situations, respond within two days.

METHOD OF MEASUREMENT

Public Information Management will be measured as the number of days elapsed from 14 days before the construction start date and no earlier than the project Notice to Proceed through Final Acceptance, excluding days elapsed during suspension of work. Failure to provide acceptable Public Information Management will result in withholding payment for the days affected as determined by the Engineer.

BASIS OF PAYMENT

Pay under:

Pay Item	**Pay Unit**
Public Information Management (Tier IV)	Day

Payment for Public Information Management will be full compensation for each measured day where the work, materials, and equipment to provide public information as per this specification.

If the Contractor fails to complete construction within the approved contract time, CDOT will not pay for Public Information Management for the period after expiration of the approved contract time. The Contractor shall continue to provide Public Information Management through Final Acceptance at its expense.

During suspension of work, no Public Information Management days will be paid.

REVISION OF SECTION 627 AND 713
PREFORMED THERMOPLASTIC PAVEMENT MARKING

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

CONSTRUCTION REQUIREMENTS

In subsection 627.09, first paragraph, delete the first sentence and replace with the following:

The markings shall consist of a resilient white, yellow, or other color thermoplastic product with glass beads and anti-skid elements uniformly distributed throughout the entire cross-sectional area to ensure that skid resistance and retroreflectivity are maximized.

Section 627 of the Standard Specifications is hereby revised for this project to include the following:

Subsection 627.09 (c) is hereby added to the Standard Specifications for this project as follows:

(c) Inlaid (X-walk/Stop-bar)

All Preformed Thermoplastic Pavement Marking surfaces shall be ground before placement of proposed marking. Depth of grinding shall be such as to completely remove any existing pavement markings and to have a nominal depth of 125 milliinches (mils) +/- 10 mils. The inlaid area for the new Preformed Thermoplastic Pavement Marking shall be in the same shape or pattern as the Preformed Thermoplastic Pavement Marking that is being installed. Grinding of existing preformed thermoplastic pavement marking and existing asphalt shall not be measured and paid for separately, but shall be included in the work.

Colorado epoxy glass beads and anti-skid elements applied to the surface of the material to ensure the required skid resistance and retroreflectivity will not be measured and paid for separately, but shall be included in the work.

Surface shall be dry and free of dirt, dust, chemicals, and significant oily substances. Existing pavement markings shall be removed prior to installation of Preformed Thermoplastic Pavement Marking in areas where markings overlap. Application procedures for Portland concrete pavement shall be as described above except a compatible primer sealer shall be applied before application of marking to ensure proper adhesion.

The Contractor shall require the stencil manufacturer to provide on-site training prior to installation of the first stencil. All crew members on the work site shall be certified by the stencil manufacturer. The training shall include surface preparation and stencil installation for both hot bituminous pavement and concrete pavement. The training shall be coordinated with and attended CDOT project engineers and inspectors. Training shall be incidental to the work.

1. The Contractor shall use a durable, high skid resistant, retroreflective pavement marking material suitable for use as interstate shields; route shields; and bike path, roadway, intersection, airport, commercial, or private pavement delineation and markings.

    A. The markings shall be a resilient white, yellow, or other color thermoplastic product, the surface of which shall contain glass beads and abrasives in an alternating pattern. The markings shall be resistant to the detrimental effects of motor fuels, lubricants, hydraulic fluids, etc.

Lines, legends, and symbols shall be capable of being affixed to bituminous or Portland cement concrete pavements by the use of the normal heat of a propane torch.

B. The markings shall be capable of conforming to pavement contours, breaks, and faults through the action of traffic at normal pavement temperatures. The markings shall have resealing characteristics, such that it is capable of fusing with itself and previously applied thermoplastic when heated with the torch.

C. The markings shall not have minimum ambient and road temperature requirements for application, without any preheating of the pavement or special storage, handling, preheating, or treatment of the material before application.

2. Manufacturing location, control and International Standards Organization (ISO) Certification: The marking material must be produced in the United States, and the manufacturer must be ISO 9001:2015 certified for design, development, and manufacturing of preformed thermoplastic pavement markings, and provide proof of current certification.

3. Material: The marking material shall be composed of an ester modified rosin resistant to degradation by motor fuels, lubricants, etc. in conjunction with aggregates, pigments, binders, abrasives, and glass beads which have been factory produced as a finished product. The marking material shall meet the requirements of the current edition of the MUTCD. The thermoplastic material shall conform to AASHTO designation M249, with the exception of the relevant differences due to the material being supplied in a preformed state.

A. Graded Glass Beads

(1) The material shall contain a minimum of 30 percent intermixed graded glass beads by weight. The intermixed beads shall conform to AASHTO designation M247, with minimum 80 percent true spheres and minimum refractive index of 1.50.

(2) The material shall have factory applied coated surface beads and abrasives at a rate of ½ pound (0.23 kilogram) [± 20 percent] per 11 square feet (1 square meter) each in addition to the intermixed beads. The surface beads and abrasives shall be applied evenly across the surface of the material so that the surface is covered completely with glass beads and abrasive materials. The abrasive material shall have a minimum hardness of 9 (Mohs scale). The factory applied coated surface beads shall have a minimum of 80 percent true spheres, have a minimum refractive index of 1.50, and meet the following gradation:

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REVISION OF SECTION 627 AND 713
PREFORMED THERMOPLASTIC PAVEMENT MARKING

Size Gradation		Retained, %	Passing, %
US Mesh	Um		
12	1700	0 - 2%	98 - 100%
14	1400	0 - 6%	94 - 100%
16	1180	1 - 21%	79 - 99%
18	1000	28 - 62%	38 - 72%
20	850	62 - 71%	29 - 38%
30	600	67 - 77%	23 - 33%
50	300	86 - 95%	5 - 14%
80	200	97 - 100%	0 - 3%

B. Pigments

(1) White: The material shall be manufactured with sufficient titanium dioxide pigment to meet FHWA Docket No. FHWA-99-6190 Table 5 and Table 6 as revised and corrected.

(2) Red, Blue, and Yellow: The material shall be manufactured with sufficient pigment to meet FHWA Docket No. FHWA-99-6190 Table 5 and Table 6 as revised and corrected. The yellow pigments shall be organic and shall be heavy-metal-free.

(3) Other Colors: The pigments shall be heavy-metal-free.

C. Heating indicators: The top surface of the material (same side as the factory applied surface beads/abrasives) shall have regularly spaced indents. The closing of these indents during application shall act as a visual cue that the material has reached a molten state allowing for satisfactory adhesion and proper bead embedment, and as a post-application visual cue that the application procedures have been followed.

D. Skid Resistance: The surface of the preformed thermoplastic (anti-skid material) items shall contain factory applied anti-skid material with a minimum hardness of 9 (Mohs scale). Upon application the material shall provide a minimum skid resistance value of 60 British Pendulum Number (BPN) when tested according to American Society for Testing and Materials (ASTM) E303. The surface beads and abrasives shall be applied evenly across the surface of the material so that the surface is covered completely with glass beads and abrasive materials.

E. Thickness: The material shall be supplied at a minimum thickness of 125 mils (3.15 millimeters (mm)).

F. Retroreflectivity: The material, when applied in accordance with manufacturer's guidelines, shall demonstrate a uniform level of sufficient nighttime retroreflection when tested in accordance to ASTM E1710. The applied material shall have an initial minimum intensity

reading of 275 millicandelas per square meter per lux (mcd·m-2·lx-1) for white, as measured with a pavement marking retroreflectometer.

G. Environmental Resistance: The material shall be resistant to deterioration due to exposure to sunlight, water, salt, or adverse weather conditions and impervious to oil and gasoline. Only Preformed Thermoplastic Pavement Marking material listed on the Department's approved products list may be used.

BASIS OF PAYMENT

Subsection 627.13 shall include the following:

Pay item	Pay unit
Preformed Thermoplastic Pavement Marking (Xwalk-Stop Line)	SF
Preformed Thermoplastic Pavement Marking (Word-Symbol)	SF

REVISION OF SECTION 630
MOBILE ATTENUATOR

Section 630 of the Standard Specifications is hereby revised for this project as follows:

Subsection 630.01 shall include the following:

This work shall consist of furnishing, operating, and maintaining a truck with an attached impact attenuator.

Subsection 630.09 shall include the following:

Mobile Attenuator Options:

Truck Mounted Attenuator. The Contractor shall supply a vehicle with a truck mounted attenuator approved by the FHWA to meet NCHRP 350 criteria for level TL-3 collisions. The attenuator shall be mounted to a suitable truck in a manner meeting the Manufacturer's specifications. The truck shall be furnished with a roof mounted Advance Warning Flashing or Sequencing Arrow Panel (B Type). The truck shall be used when setting up or taking down the work zone and shall be parked in the activity area protecting the construction work while work is being performed, unless otherwise directed.

Trailer Attenuator. The Contractor shall supply a vehicle with an attached trailer attenuator approved by the FHWA to meet NCHRP 350 criteria for level TL-3 collisions. The trailer attenuator shall be attached to a suitable host truck in a manner meeting the Manufacturer's specifications, to include factory-installed 20-ton (minimum) rated pintle hook and ½-inch (minimum) steel frame plate, or as specified by Manufacturer. The trailer shall be furnished with a mounted Advance Warning Flashing or Sequencing Arrow Panel (B Type).

The weight of the host truck shall be between 10,000 and 20,000 lbs, or as specified by the trailer attenuator manufacturer. The Contractor shall provide a certified scale ticket confirming the weight of the truck without trailer attached.

The Trailer Attenuator attached to its host truck shall be used when setting up or taking down the work zone and shall be parked in the activity area protecting the construction work while work is being performed, unless otherwise directed. A buffer zone shall be provided in front of the host truck, for worker safety. This buffer zone shall be in accordance with the manufacturer's recommendations, but shall be no less than 100 feet in length, unless otherwise directed.

Subsection 630.13 shall include the following:

Maintenance, storage, operation, and all repairs of Mobile Attenuator and associated vehicle shall be the responsibility of the Contractor.

Subsection 630.15 shall include the following:

Mobile Attenuators will be measured as the actual number of attenuators that are used during construction; or the actual number of authorized 24-hour periods that the attenuator is used.

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REVISION OF SECTION 630
MOBILE ATTENUATOR

Subsection 630.16 shall include the following:

Pay Item	**Pay Unit**
Mobile Attenuator	Day

Payment will be full compensation for all labor, materials and equipment required to operate and maintain the truck and attenuator for the duration of the project, including the attenuator and flashing panel.

REVISION OF SECTION 630
PORTABLE MESSAGE SIGN PANEL

Section 630 of the Standard Specifications is hereby revised for this project as follows:

Subsection 630.01 shall include the following:

This work includes furnishing, operating, and maintaining a portable message sign panel.

Add subsection 630.031 immediately following subsection 630.03 as follows:

630.031 Portable Message Sign Panel. Portable message sign panel shall be furnished as a device fully self-contained on a portable trailer, capable of being licensed for normal highway travel, and shall include leveling and stabilization jacks. The panel shall display a minimum of three - eight character lines. The panel shall be a dot-matrix type with an LED legend on a flat black background. LED signs shall have a pre-default message that activates before a power failure. The sign shall be solar powered with independent back-up battery power. The sign shall be capable of 360 degrees rotation and shall be able to be elevated to a height of at least five feet above the ground measured at the bottom of the sign. The sign shall be visible from one-half mile under both day and night conditions. The message shall be legible from a minimum of 750 feet. The sign shall automatically adjust its light source to meet the legibility requirements during the hours of darkness. The sign enclosure shall be weather tight and provide a clear polycarbonate front cover.

Solar powered message signs shall be capable of operating continuously for 10 days without any sun. All instrumentation and controls shall be contained in a lockable enclosure. The sign shall be capable of changing and displaying sign messages and other sign features such as flash rates, moving arrows, etc.

Each sign shall also conform to the following:

(1) In addition to the onboard solar power operation with battery back-up, each sign shall be capable of operating on a hard wire, 100-110 VAC, external power source.

(2) All electrical wiring, including connectors and switch controls necessary to enable all required sign functions shall be provided with each sign.

(3) Each sign shall be furnished with an operating and parts manual, wiring diagrams, and trouble-shooting guide.

(4) The portable message sign shall be capable of maintaining all required operations under Colorado mountain-winter weather conditions.

(5) Each sign shall be furnished with an attached license plate and mounting bracket.

(6) Each sign shall be wired with a 7-prong male electric plug for the brake light wiring system.

Subsection 630.13 shall include the following:

The portable message sign panel shall be on the project site at least 7 Calendar days prior to the start of active roadway construction. Maintenance, storage, operation, relocation to different sites during the project, and all repairs of portable message sign panels shall be the responsibility of the Contractor.

Subsection 630.15 shall include the following:

Portable message sign panels will be measured one of the two following ways:

(1) By the actual number of days each portable message sign is used on the project as approved by the Engineer.

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REVISION OF SECTION 630
PORTABLE MESSAGE SIGN PANEL

(2) By the maximum number of approved units in use on the project at any one time. Subsection 630.16 shall include the following:

Pay Item	**Pay Unit**
Portable Message Sign Panel	Each

REVISION OF SECTION 630
UNIFORMED TRAFFIC CONTROL
(LOCAL AGENCY)

Section 630 of the Standard Specifications is hereby revised for this project to include the following:

DESCRIPTION

This work consists of furnishing a uniformed police agency officer from the following local agency to perform uniformed traffic control:

Colorado State Patrol, Phone Number: 303.239.4501

When called for in the Contract, this work includes furnishing a vehicle for the officer to use in performing uniformed traffic control.

MATERIALS

(a) *Qualifications.* The local agency officer shall have completed "The Safe and Effective Use of Law Enforcement Personnel in Work Zones" Training Course. The Contractor shall provide copies of documentation certifying the officer's successful completion of this course.

(b) *Traffic Control Vehicles.* When called for in the Contract, the Contractor shall furnish white sedans to be used by uniformed police agency officers in the performance of Uniformed Traffic Control duties. The Contractor shall be responsible for licensing, insuring, servicing, and fueling the vehicle.

For each Traffic Control Vehicle furnished by the Contractor, the Contractor shall furnish Class 1 SAE certified light bar and control panel for exclusive use by uniformed police agency officers while performing Uniformed Traffic Control. The light bar shall have the following configuration:

(1) minimum of 44 inches in length, and shall be either permanently or temporarily attached to the top of the vehicle.
(2) flash red on the driver side and blue on the passenger side
(3) equipped with an amber-colored directional device in the rear of the bar.
(4) have alley and takedown lights.
(5) The control panel shall be capable of controlling the front of the bar and the rear of the bar separately.
(6) The traffic advisor shall be controlled separately.

The light bars shall be mounted on traffic control vehicles and shall be maintained in good operating condition at all times. The Contractor shall obtain a permit from the police or sheriff department, as appropriate, for the use of the light bars. The Contractor shall keep the light bars covered at all times when the traffic control vehicle is being used by someone other than the authorized uniform police agency officer.

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REVISION OF SECTION 630
UNIFORMED TRAFFIC CONTROL
(LOCAL AGENCY)

METHOD OF MEASUREMENT

Uniformed Traffic Control will be measured by the total number of hours that are required for uniformed traffic control including minimum shift hours required by the agency.

Traffic Control Vehicle will be measured by the actual number of vehicles provided by the Contractor and used as authorized by the Engineer, and will include maintenance of each vehicle, light bars, licensing, insurance and fueling.

BASIS OF PAYMENT

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

Uniformed Traffic Control (Vehicle) will be measured as the contract unit price per hour for the traffic control vehicle.

The accepted number of Traffic Control Vehicles will be paid for at the contract unit price for each vehicle.

Payment will be made under:

Pay Item	**Pay Unit**
Uniformed Traffic Control	Hour
Uniformed Traffic Control (Vehicle)	Hour

Hours of Uniformed Traffic Control or Uniformed Traffic Control (Vehicle) that are not authorized or approved will not be paid for. Scheduling of traffic control will not be measured and paid for separately, but shall be included in the work.

Payment for the item Traffic Control Vehicle will be full compensation for all work, light bars, other equipment, and other items necessary to complete the item. Licensing, insuring, servicing, and fueling the vehicle will not be paid separately, but shall be included in the work.

TRAFFIC CONTROL PLAN - GENERAL

The key elements of the Contractor's method of handling traffic (MHT) are outlined in subsection 630.08.

The components of the Traffic Control Plan 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, 20 and 23.

(3) Schedule of Construction Traffic Control Devices and Construction Traffic Control Plans included in the plans for this project.

(4) Tabulation of Traffic Control Devices

This project includes restrictions to work times and days that affect traffic during peak traffic times and days, holidays, holiday evenings, holiday weekends, and other circumstances as described in this special provision. Wherever other laws, ordinances, regulations, or orders are more restrictive, they shall take precedence over these requirements.

All lane closures are subject to the Region 1 Lane Closure Strategy and shall be subject to the approval of the CDOT Engineer. Each lane closure request shall be made at least 48 hours in advance of the time the lane closure is to be implemented. Lane closures will not be allowed to remain unless being utilized continuously for the purpose for which they were set up. http://hermes.cde.state.co.us/drupal/islandora/object/co%3A21957/datastream/OBJ/view

The Contractor shall coordinate and cooperate fully with the Department, utility owners, and other contractors, to assure adequate and proper traffic control is provided at all times.

The Contractor shall coordinate and cooperate fully with any others providing traffic control for other operations to assure that work or traffic control devices do not interfere with the free flow of traffic except as allowed by the Traffic Control Plan.

RESTRICTED WORK TIMES FOR PEAK TRAFFIC TIMES

Mainline highway single lane closures will be allowed for Closures Anytime on weekdays. No weekend work will be allowed unless directed by the Engineer.

Weekdays are considered Sunday evening to Friday evening. Weekend is considered Friday evening to Sunday evening.

The Contractor shall be limited to one (1) lane closure at one location and in one direction of traffic, unless directed by the Engineer.

Shoulder closures, shall be performed Monday through Friday (except holidays) 6:00 AM to 6:00 PM. No weekend work will be allowed unless directed by the Engineer.

Ramp closures, shall be performed Monday through Friday (except holidays) 6:00 PM to 6:00 AM, 9:00 AM to 3:00 PM and on weekends 6:00 PM to 11:00 AM.

The Contractor shall be limited to one (1) active work site, unless directed by the Engineer.

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TRAFFIC CONTROL PLAN – GENERAL

Work performed and material placed that interferes with traffic during the times and in the locations that the roadway is specified to remain open will not be paid for unless the work is directed by the Engineer to be done during those times.

RESTRICTED WORK TIMES FOR HOLIDAYS

Work that interferes with traffic on any day of a holiday shall not be permitted. Holidays shall be as defined in subsection 101.33. Section 108.07 of Standard Specifications places additional restrictions on work occurring on weekends, holidays and extended holiday weekends.

CONSTRUCTION

The Contractor shall submit an MHT, all appropriate Traffic Control Supervisor and Flagger documentation to the Engineer prior to approval of the setting any traffic control device,

All costs incidental to the foregoing requirements shall be included in the original contract prices for the project, including any additional traffic / pedestrian control.

During the construction of this project, traffic shall use the present traveled roadway.

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

All personnel vehicle parking is prohibited where it conflicts with safety, access or flow of traffic.

The Contractor shall Maintain open communication with the Project Engineer about all aspects of the daily and weekly work schedule.

All construction traffic control devices including signs installed as part of this project shall be installed, as stated in the Traffic Plans and CDOT's M & S Standards. Construction signing shall be removed unless work is in progress or devices have been left on the job site. This work shall be included in the price of the traffic control devices. All portable signs shall be removed at the end of each working day, and shall not block or impede other existing traffic control devices, or sidewalks for pedestrians, disabled persons or bicycles.

The Contractor shall equip its construction vehicles with flashing amber lights. Flashing lights on vehicles shall be visible from all directions.

The Contractor shall maintain access to all roadways, side streets, walkways, bike paths and driveways at all times unless otherwise directed by the Engineer.

The Contractor shall maintain continuous access through the project for pedestrians, bicycles and disabled persons, except where such access is prohibited prior to construction. When the existing access route is disrupted by construction or construction related activities, a temporary access shall be provided. All pedestrian access shall be delineated through the work area using proper channelizing devices.

Traffic control devices shall not be stored on project site.

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TRAFFIC CONTROL PLAN - GENERAL

Excavations or holes shall be filled in or fenced at the Engineers direction when unattended. During non-construction periods (nights, weekends, holidays, etc.), all work shall be adequately protected to ensure the safety of vehicular and pedestrian traffic, as detailed in the Contractor's MHT. Excavations near the roadway shall be filled or shouldered up at the end of each work day.

FORCE ACCOUNT ITEMS

DESCRIPTION

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

BASIS OF PAYMENT

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

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

Force Account Item	Quantity	Estimated Amount
F/A Minor Contract Revisions	F.A.	$ **200,000.00**
F/A Fuel Cost Adjustment	F.A.	$ 1,000.00
F/A Erosion Control	F.A.	$ 4,000.00
F/A Environmental Health & Safety Management	F.A.	$10,000.00

Force Account Descriptions:

F/A 01 Minor Contract Revisions - This work consists of minor work authorized and approved by the Engineer, which is not included in the Contract drawings or specifications and is necessary to accomplish the scope of work of the Contract.

F/A 02 Partnering – This work is described in the Standard Special Provision “Partnering”.

F/A 03 Erosion Control – This Force Account is to pay for any other erosion control items the TECS will need during the duration of this project. All items shall be pre-approved by the Engineer prior to installation or they will be at no cost to the project.

UTILITIES

The known utilities within the limits of this project are:

UTILITY	UTILITY TYPE	CONTACT	EMAIL/PHONE
Alternative Energy Solutions	Fiber	Mark Ray	1.clr.inc@gmail.com 303-947-4641
Bijou Telephone Coop	Fiber/Telephone	Brian Creveling	creveling@netecin.net 303-822-5400
Century Link (Lumen)	Fiber	Thomas Longan	Thomas.Longan@centurylink.com
Eastern Slope Rural Telephone	Fiber/Telephone	Clint Felzien	clintf@estra.com 719-743-2460
CORE (Intermountain REA)	Electric	GIS Department	maps@irea.coop
CDOT Region 1	Electric, Fiber, Fiber Backbone	Jill Scott	jill.scott@state.co.us 303-512-5805
Zayo Bandwidth	Fiber	Eric Boe	Eric.Boe@zayo.com 303-481-6121

The work described in these plans and specifications requires full cooperation between the Contractor and the utility owners in accordance with Subsection 105.11 in conducting their respective operations, 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.

PART 1 – CONTRACTOR SHALL PERFORM THE WORK LISTED BELOW:

Coordinate project construction with the performance by the utility owner of each utility work element listed in Part 2 below. Perform preparatory work specified in Part 2 for each utility work element. Provide an accurate construction schedule that includes all utility work elements to the owner of each impacted utility. Provide each utility owner with periodic updates to the schedule. Conduct necessary utility coordination meetings, and provide other necessary accommodations as directed by the Engineer. Notify each utility owner in writing, with a copy to the Engineer, prior to the time each utility work element is to be performed by the utility owner. Provide the notice the number of days specified in Part 2 immediately prior to the time the utility work must be begun to meet the project schedule.

Provide traffic control, as directed by the Engineer, for any utility work by the utility owner expected to be coordinated with construction. However, traffic control for utility work outside of typical project work hours shall be the responsibility of the utility owner.

Perform each utility work element for every utility owner listed here in Part 1. Notify each utility owner in advance of any work being done by the Contractor to its facility, so that the utility owner can coordinate its inspections for final acceptance of the work with the Engineer.

UTILITIES

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

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

The Contractor shall be responsible for coordinating the adjustment of utilities on this project. The Contractor shall keep each utility company advised of any work being performed in the vicinity of the facilities, so that each utility company can coordinate any needed locates, adjustments or inspections. Contractor shall provide the appropriate utility company ample notice, but not less than two (2) working days, prior to commencing activities in the vicinity of their facilities. Any additional work performed by the Contractor on behalf of the impacted utility company shall be paid for by the Town, but shall be paid by the utility company requiring the work, unless otherwise agreed to in writing by the Engineer.

PART 2 – UTILITY OWNERS SHALL PERFORM THE WORK LISTED BELOW:

Although the Town's Contractor shall provide traffic control for utility work expected to be coordinated with construction, traffic control for utility work outside of typical project work hours shall be the responsibility of the utility owner. The utility owner shall prepare and submit to the Town Engineer a Method of Handling Traffic for utility work to be performed outside typical project work hours. The utility owner shall obtain acceptance of the Method of Handling traffic from the Town Engineer prior to beginning the utility work to be performed outside typical project work hours.

This work will be performed by the utility owners as necessary to avoid conflicts with construction activities. New locations shall be as indicated in the plans. Utility owners shall comply with schedule requirements of the Contractor and make every effort not to impact the overall construction schedule. Unless otherwise approved by the Engineer, abandoned aboveground appurtenances such as pedestals shall be removed and abandoned underground utilities and manholes/handholes shall be abandoned in place.

Utility owners are responsible for obtaining all necessary permits from the Town of Bennett and the State of Colorado, as required.

CORE (formerly Intermountain Rural Electric Association (IREA))
After The Town Contractor has completed the installation of the proposed traffic signals, including traffic controller cabinet, luminaires, conduit and wiring to the proposed power source as shown on the plans, CORE forces shall connect the power source. This work is expected to be coordinated with construction and take 1 working day to complete.

Contractor shall provide the utility owner written notice 30 days immediately prior to each utility work element expected to be coordinated with construction.

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UTILITIES

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.

January 6, 2022

REVISION OF SECTION 103
CONSIDERATION OF PROPOSALS

NOTICE

This Standard Special Provision (SSP) revises or modifies CDOT's *Standard Specifications for Road and Bridge Construction*. These are the official instructions for its use on CDOT construction projects, and the Construction Engineering Services Branch has reviewed, approved, and issued it. Use as written without change. Do not use modified versions of this SSP on CDOT construction projects. Do not use this special provision on CDOT projects in a manner other than specified in the instructions without approval by CDOT's Standards and Specifications Unit. The instructions for use appear below.

Other agencies using the *Standard Specifications for Road and Bridge Construction* to administer construction projects may use this special provision appropriately and at their own risk.

Instructions for use on CDOT construction projects:
Use this standard special provision on all projects.

REVISION OF SECTION 103
CONSIDERATION OF PROPOSALS

Revise Section 103 of the Standard Specifications as follows:

Delete Section 103.01 and replace it with the following:

103.01 Consideration of Proposals. After the proposals (bids) are opened and read, they will be evaluated, and the Contract awarded or rejected in accordance with the “Rules” referenced in subsection 102.01.

The low responsible bidder shall submit a completed CONTRACTORS PERFORMANCE CAPABILITY STATEMENT, Form 605, and a completed ASSIGNMENT OF ANTITRUST CLAIMS, Form 621, to the Award Officer prior to 4:30 P.M. on the fifth calendar day after the bid opening.

To be eligible for contracting with CDOT, the apparent low responsible bidder shall have an account in the B2GNow software system.

Failure to submit the Forms 605 and 621 and to have an account in the B2GNow software system may result in the denial of award to the apparent low responsible bidder and forfeiture of the proposal guaranty.

October 26, 2021

REVISION OF SECTION 105
CONTROL OF WORK

NOTICE

This Standard Special Provision (SSP) revises or modifies CDOT's *Standard Specifications for Road and Bridge Construction*. These are the official instructions for its use on CDOT construction projects, and have been reviewed, approved, and issued by the Construction Engineering Services Branch. Use as written without change. Do not use modified versions of this SSP on CDOT construction projects. Do not use this special provision on CDOT projects in a manner other than specified in the instructions without approval by CDOT's Standards and Specifications Unit. The instructions for use appear below.

Other agencies using the *Standard Specifications for Road and Bridge Construction* to administer construction projects may use this special provision appropriately and at their own risk.

Instructions for use on CDOT construction projects:
Use this standard special provision on all projects.

REVISION OF SECTION 105
CONTROL OF WORK

Revise Section 105 of the Standard Specifications to include:

In 105.21 Acceptance, add this under (b) as the new third paragraph:

If not included in the Partial or Final Acceptance letter, no later than 3 working days after the acceptance letter is provided to the Contractor, the Engineer will provide in writing a detailed list of all remaining documentation required by the Contract. Upon reviewing and accepting the remaining documentation, and with no other outstanding issue(s), the Engineer will release retainage as follows:

1. 65% of the current retainage shall be released.
2. If the release of retainage is less than $10,000, no retainage will be released.
3. Retainage will be released only to the extent that the remaining retainage shall not be less than $20,000.

October 1, 2021

REVISION OF SECTION 106
BUY AMERICA REQUIREMENTS
NON-FEDERAL AID

NOTICE

This is a standard special provision that revises or modifies CDOT's *Standard Specifications for Road and Bridge Construction.* It has gone through a formal review and approval process and has been issued by CDOT's Project Development Branch with formal instructions for its use on CDOT construction projects. It is to be used as written without change. Do not use modified versions of this special provision on CDOT construction projects, and do not use this special provision on CDOT projects in a manner other than that specified in the instructions unless such use is first approved by CDOT's Standards and Specifications Unit. The instructions for use on CDOT construction projects appear below.

Other agencies which use the *Standard Specifications for Road and Bridge Construction* to administer construction projects may use this special provision as appropriate and at their own risk.

Instructions for use on CDOT construction projects:

Use on projects which have no federal funding.

October 1, 2021

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.

October 1, 2021

REVISION OF SECTION 106
CONFORMITY TO THE CONTRACT OF HOT MIX ASPHALT
(LESS THAN 5000 TONS)

NOTICE

This is a standard special provision that revises or modifies CDOT's *Standard Specifications for Road and Bridge Construction*. It has gone through a formal review and approval process and has been issued by CDOT's Project Development Branch with formal instructions regarding its use on CDOT construction projects. It is to be used as written without change. Do not use modified versions of this special provision on CDOT construction projects, and do not use this special provision on CDOT projects in a manner other than that specified in the instructions unless such use is first approved by the Standards and Specifications Unit of the Project Development Branch. The instructions for use on CDOT construction projects appear below.

Other agencies that use the *Standard Specifications for Road and Bridge Construction* to administer construction projects may use this special provision as appropriate and at their own risk.

INSTRUCTIONS FOR USE ON CDOT CONSTRUCTION PROJECTS:

Use this standard special provision on projects having less than 5000 Tons of Hot Mix Asphalt (HMA), as determined by the Region Materials Engineer.

REVISION OF SECTION 106
CONFORMITY TO THE CONTRACT OF HOT MIX ASPHALT
(LESS THAN 5000 TONS)

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

Delete subsection 106.05 and replace with the following:

106.05 Sampling and Testing of Hot Mix Asphalt. All hot mix asphalt, Item 403, except Hot Mix Asphalt (Patching) and temporary pavement shall be tested in accordance with the following program of process control testing and acceptance testing:

The Contract will specify whether process control testing by the Contractor is mandatory or voluntary.

(a) *Process Control Testing.*

1. Mandatory Process Control. When process control testing is mandatory the Contractor shall be responsible for process control testing on all elements and at the frequency listed in Table 106-1. Process control testing shall be performed at the expense of the Contractor.

   After completion of compaction, in-place density tests for process control shall be taken at the frequency shown in Table 106-1. The results shall be reported in writing to the Engineer on a daily basis. Daily plots of the test results with tonnage represented shall be made on a chart convenient for viewing by the Engineer. All of the testing equipment used for in-place density testing shall conform to the requirements of acceptance testing standards, except nuclear testing devices need not be calibrated on the Department's calibration blocks.

   For elements other than in-place density, results from process control tests need not be plotted, or routinely reported to the Engineer. This does not relieve the Contractor from the responsibility of performing such testing along with appropriate plant monitoring as necessary to assure that produced material conforms to the applicable specifications. Process control test data shall be made available to the Engineer upon request.

2. Voluntary Process Control. The Contractor may conduct process control testing. Process control testing is not required, but is recommended on the elements and at the frequency listed in Table 106-1.

   All of the testing equipment used for in-place density testing shall conform to the requirements of acceptance testing standards, except nuclear testing devices need not be calibrated on the Department's calibration blocks.

(b) *Acceptance Testing.* Acceptance testing is the responsibility of the Department. For acceptance testing the Department will determine the locations where samples or measurements are to be taken and as designated in Section 403. The maximum quantity of material represented by each test result, the elements, the frequency of testing and the minimum number of test results will be in accordance with Table 106-1. The location or time of sampling will be based on the stratified random procedure as described in CP 75. Acceptance sampling and testing procedures will be in accordance with the Schedule for Minimum Materials Sampling, Testing and Inspection in the Department's Field Materials Manual. Samples for project acceptance testing shall be taken by the Contractor in accordance with the designated method. The samples shall be taken in the presence of the Engineer. Where appropriate, the Contractor shall reduce each sample to the size designated by the Engineer. The Contractor may retain a split of each sample which cannot be included as part of the Contractor's process control testing. Dispute of the acceptance test results in accordance with CP-17 will not be allowed unless a provision for check testing has been included in the Contract and it has been successfully completed. All materials being used are subject to inspection and testing at any time prior to or during incorporation into the work.

Table 106-1
SCHEDULE FOR MINIMUM SAMPLING AND TESTING FOR HMA

Element	Process Control	Acceptance (1)
Asphalt Content	1/500 tons	1/1000 tons
Theoretical Maximum Specific Gravity	1/1000 tons, minimum 1/day	1/1000 tons, minimum 1/day
Gradation (2)	1/Day	1/2000 tons
In-Place Density	1/500 tons	1/500 tons
Joint Density	1 core/2500 linear feet of joint	1 core /5000 linear feet of joint
Aggregate Percent Moisture (3)	1/2000 tons or 1/Day if less than 2000 tons	1/2000 tons
Percent Lime (3) (4)	1/Day	Not applicable

Notes:

(1) The minimum number of in-place density tests for acceptance will be 5.

(2) Process control tests for gradation are not required if less than 250 tons are placed in a day. The minimum number of process control tests for gradation shall be one test for each 1000 tons or fraction thereof.

(3) Not to be used for incentive/disincentive pay. Test according to CP-33 and report results from Form 106 or Form 565 on Form 6.

(4) Verified per Contractor's PC Plan.

(c) *Reference Conditions.* Three reference conditions can exist determined by the Moving Quality Level (MQL). The MQL will be calculated in accordance with the procedure in CP 71 for Determining Quality Level (QL). The MQL will be calculated using only acceptance tests. The MQL will be calculated on tests 1 through 3, then tests 1 through 4, then tests 1 through 5, then thereafter on the last five consecutive test results. The MQL will not be used to determine pay factors. The three reference conditions and actions that will be taken are described as follows:

1. Condition green will exist for an element when an MQL of 90 or greater is reached, or maintained, and the past five consecutive test results are within the specification limits.

2. Condition yellow will exist for all elements at the beginning of production or when a new process is established because of changes in materials or the job-mix formula, following an extended suspension of work, or when the MQL is less than 90 and equal to or greater than 65. Once an element is at condition green, if the MQL falls below 90 or a test result falls outside the specification limits, the condition will revert to yellow or red as appropriate.

3. Condition red will exist for any element when the MQL is less than 65. The Contractor shall be notified immediately in writing and the process control sampling and testing frequency increased to a minimum rate of 1/250 tons for that element. The process control sampling and testing frequency shall remain at 1/250 tons until the process control QL reaches or exceeds 78. If the QL for the next five process control tests is below 65, production will be suspended.

   If gradation is the element with MQL less than 65, the Department will test one randomly selected sample in the first 1250 tons produced in condition red. If this test result is outside the tolerance limits, production will be suspended. (This test result will not be included as an acceptance test.)

After condition red exists, a new MQL will be started. Acceptance testing will stay at the frequency shown in Table 106-1. After three acceptance tests, if the MQL is less than 65, production will be suspended.

Production will remain suspended until the source of the problem is identified and corrected. Each time production is suspended, corrective actions shall be proposed in writing by the Contractor and approved in writing by the Engineer before production may resume.

Upon resuming production, the process control sampling and testing frequency for the elements causing the condition red shall remain at 1/250 tons. If the QL for the next five process control tests is below 65, production will be suspended again. If gradation is the element with MQL less than 65, the Department will test one randomly selected sample in the first 1250 tons produced in condition red. If this test result is outside the tolerance limits, production will be suspended.

March 18, 2022

REVISION OF SECTIONS 106 AND 412
PCCP THICKNESS

NOTICE

This Standard Special Provision (SSP) revises or modifies CDOT's *Standard Specifications for Road and Bridge Construction*. These are the official instructions for its use on CDOT construction projects, and the Construction Engineering Services Branch has reviewed, approved, and issued it. Use as written without change. Do not use modified versions of this SSP on CDOT construction projects. Do not use this special provision on CDOT projects in a manner other than specified in the instructions without approval by CDOT's Standards and Specifications Unit. The instructions for use appear below.

Other agencies using the *Standard Specifications for Road and Bridge Construction* to administer construction projects may use this special provision appropriately and at their own risk.

Instructions for use on CDOT construction projects:

Use this standard special provision on most projects with concrete pavement. On certain projects, the use of MPI should be excluded due to shallow metallic utility lines and multiple boxes, for example, in urban areas.

REVISION OF SECTIONS 106 AND 412
PCCP THICKNESS

Revise Sections 106 and 412 of the Standard Specifications as follows:

Add the following to Subsection 106.06(a)6.:

D. The Contractor shall supply an MIT Scan T2 or MIT Scan T3 and the associated tests plates when pavement thick acceptance is based on magnetic pulse induction (MPI).

Delete Subsection 106.06 (b) and replace with the following:

(b)Acceptance Testing. Acceptance testing frequencies shall be per the Schedule (Owner Acceptance) in the Department's Field Materials Manual. Except for flexural strength, acceptance tests will be conducted by and at the expense of the Department. Acceptance sampling and testing procedures will be per the Department's Field Materials Manual with the following exceptions and inclusions:

A split sample from an acceptance test shall not be used for a process control test. The Engineer will designate the location where samples are to be taken. Samples shall be taken by the Contractor per CP 61. The Engineer will be present during the sampling and take possession of all acceptance samples. Samples transported in different containers will be combined and mixed before molding specimens. All materials are subject to inspection and testing at all times.

Pavement thickness acceptance will be determined by cores or magnetic pulse induction (MPI).

Acceptance tests for thickness using MPI shall be the Contractor's process control tests. MPI testing shall be per AASHTO T359

When compressive strength testing is specified, the Engineer will distribute electronically to the concrete supplier all compressive-strength Owner Acceptance (OA) data for the concrete supplied to the project. The Engineer will distribute the OA compressive strength data within two business days of the 7-day and 28-day compressive strength testing. The data will include the compressive strength and batch ticket number at a minimum. The Contractor shall not have a valid dispute or claim as a result of any action or inaction by the Department related to the distribution of test results.

The compressive strength test for acceptance will be the average compressive strength of three test cylinders cast in plastic molds from a single sample of concrete and cured under standard laboratory conditions before testing. If the compressive strength of any one specimen differs from the average by more than 10 percent, that specimen will be deleted, and the average strength will be determined using the remaining two specimens. If the compressive strength of more than one specimen differs from the average by more than 10 percent, the average strength will be determined using all three specimens. Each set of three cylinders will be tested at 28 days after molding.

Acceptance tests for flexural strength shall be the Contractor's process control tests. The flexural strength tests shall be the average flexural strength of four test beams. The test beams shall be prepared according to AASHTO T23. The flexural strength of each specimen shall be measured according to AASHTO T97 with the following additional requirements: If the flexural strength of only one specimen differs from the average by more than 10 percent, that specimen shall be deleted, and the average strength shall be determined using the remaining three specimens. If the flexural strength of more than one specimen differs from the average by more than 10 percent, the test value shall be the average of all four specimens. Each set of four beams shall be tested at 28 days after molding. If the nominal maximum aggregate size of the mix is 3/4 inches or less, then the Contractor shall prepare three additional test beams using the 4x4x14 inch molds. The 4x4x14 inch specimens will be tested 28 days. The results of the 4x4x14 inch specimens will be for information only and will not be used to determine the acceptability of the concrete. Results of the 4x4x14 inch specimens will be reported to the Engineer with the corresponding acceptance test results. These additional specimens are being used to evaluate the validity of using smaller test specimens for acceptance.

Delete Subsection 412.21 and replace with the following:

412.21 **Determining Pavement Thickness**. Pavement thickness will be determined by cores or magnetic pulse induction (MPI). The Contractor shall select the pavement thickness determinization method at the pre-paving conference.

(a) Pavement thickness using cores. The Contractor shall perform the process control (PC) testing for pavement thickness. A process control testing plan shall be submitted and must be approved before the start of paving. This PC testing plan shall include determining the thickness of freshly finished concrete pavement at a minimum frequency of one measurement per 1,250 linear feet of each traffic lane. All shoulders 8 feet or greater in width shall be tested as a separate traffic lane. Shoulders less than 8 feet wide shall be included in the adjacent lane. Areas such as sections of mainline pavement that are less than 1,250 linear feet long, intersections, entrances, crossovers, ramps, etc., shall be grouped into units of 1,000 square feet or remaining fraction. A minimum of one random measurement shall be taken in each unit.

The Engineer may inspect the Contractor's PC tests at any time during the paving operations. Approval and inspection of the Contractor's PC plan and operations does not constitute acceptance of the pavement thickness and does not relieve the Contractor of the responsibility for providing the required hardened pavement cores for project acceptance testing. The Contractor shall provide daily written reports to the Engineer listing the daily results of the PC thickness measurements.

Project acceptance (PA) testing will be the responsibility of the Engineer. PA testing consists of determining pavement thickness by measuring the length of cores taken by the Contractor from the hardened pavement as outlined below. Acceptance of the pavement thickness and price adjustment for deficient thickness will be based on project acceptance tests.

The Engineer will designate the time and location of the coring and will be present during the coring operation. The Contractor shall obtain 4-inch or 6-inch nominal diameter cores from the hardened pavement that are suitable for measuring per AASHTO T-148. When the cores are removed from the pavement, the Engineer will take possession and determine their length per AASHTO T-148.

The lower tolerance limit (TL) for pavement thickness shall be Plan Thickness (PT) minus 0.4 inches. This TL shall be used in the formulas in Section 105 for Incentive and Disincentive Payments (I/DP), Quality Levels (QL) and Pay Factor (PF) determinations. Any pavement thickness test value that exceeds the PT by more than 1.0 inch shall be assigned a value of PT +1.0 inch for the purpose of calculating the QL, PF and I/DP.

Core locations shall be determined by a random procedure so that each area has a randomly selected coring location. One core will be taken at each location.

Where the new PCCP overlays an existing roadway, cores for measuring pavement thickness shall be determined by a stratified random procedure in the longitudinal direction and by the point of minimum required thickness in the lateral direction as shown in the plans. If existing field conditions show a condition where the point of minimum thickness in the lateral direction as shown in the plans is not appropriate, the Contractor shall identify the location and extent of the area to the Engineer at least 24 hours before paving. The Engineer may exclude this area from pavement thickness measurements for incentive and disincentive payments.

Pavement thickness tests will be evaluated per subsection 105.06. Additional cores will be taken at the direction of the Engineer as follows:

1. One additional core at the location of each PC or PA test that is less than PT minus 1.0 inch.
2. If the length of the additional core is greater than PT minus 1.0 inch, no additional actions will be taken and the PA test core will be used to compute I/DP for the process that includes this material.

3. If the length of the additional core is less than PT minus 1.0 inch, the area represented by this core shall become a separate process and this core will not be used to compute an I/DP. Exploratory cores shall be taken at intervals of 15 feet or less, parallel to the centerline in each direction from the affected location until two consecutive cores are found in each direction which are not less than PT minus 1.0 inch. Four additional randomly selected cores will be taken within the area represented by these cores. The four additional cores will be used to compute an I/DP per Section 105. Cores taken at locations not randomly determined, such as process control cores will not be used to compute I/DP. . Pavement areas found to be less than PT minus 1.0 inch shall be removed and replaced at the Contractor's expense.

   When the removal and replacement have been completed, four additional randomly selected cores will be taken within the area represented by this core. The four additional cores will be used to compute an I/DP per subsection 105.06. Exploratory cores will not be used to compute I/DP.

The Contractor shall repair all core holes by filling them with an approved non-shrink high-strength grout.

(b) Pavement thickness using MPI. The Contractor shall perform the process control (PC) testing for pavement thickness using MPI. A process control testing plan shall be submitted and must be approved before the start of paving. This PC testing plan shall include determining the thickness of hardened concrete pavement at a minimum frequency of one measurement per 1,250 linear feet of each traffic lane. All shoulders 8 feet or greater in width shall be tested as a separate traffic lane. Shoulders less than 8 feet wide shall be included in the adjacent lane. Areas such as sections of mainline pavement that are less than 1,250 linear feet long, intersections, entrances, crossovers, ramps, etc., shall be grouped into units of 1,000 square feet or remaining fraction thereof. A minimum of one random measurement shall be taken in each unit.

The Contractor's PC test results using MPI for pavement thickness will be used for Project Acceptance (PA) and used to calculate I/DP. PC testing will be witnessed by the Engineer.

The MPI results will be considered acceptable when the range of the three individual scans is less than or equal to 0.10 inches. If the three scans are not within 0.10 inches, a second set of three scans shall be taken. The three new scans will be considered acceptable when the range of the three individual scans is less than or equal to 0.10 inches. If the second set of three scans are not within 0.10 inches, the MPI for this location will not be used. A MPI test will be the result of the average of a set of three acceptable scans at a location. The average of the set of three scans shall be rounded to the nearest 0.04 inches. If a MPI location is unable to obtain three acceptable scans, a core shall be taken and used for thickness determination and I/DP.

A test section shall be conducted to verify the calibration and correlation of the MPI pavement thickness determination at the start of PCCP operations. The test section correlation shall be established in the first 7,500 square yards of PCCP per a stratified random sampling schedule as established in CP 75. The test section correlation verification shall consist of conducting ten pavement thickness measurements by taking a core at the MPI test locations. The Contractor shall obtain 4-inch nominal diameter cores from the hardened pavement that are suitable for measuring per AASHTO T148. When the cores are removed from the pavement the Contractor shall determine their length and then the Engineer will take possession and determine their length per AASHTO T148. A verification must be run for each MPI device used on the project. The verification of any MPI device can be run at the initial verification locations. The comparison of the PC MPI measurements and hardened concrete cores shall be within 0.15 inches to be considered a valid correlation between the two test methods.

After successful completion of the thickness measurement correlation verification process, a minimum of one hardened concrete core will be taken for every 25 MPI thickness measurements for core thickness determination. When a change in thickness or process occurs, the first three MPI location shall be cored for thickness. At a minimum, one MPI test location will be cored for thickness for each pavement thickness process, or as directed by the Engineer. A core may be taken when the MPI result is in doubt. The correlation between core and MPI thickness measurements shall be verified to be within 0.15 inches at the same location. If the thickness difference between the methods exceeds 0.15 inches, the next five MPI locations will be cored. If the thickness difference between the two methods exceeds 0.15 inches on any location the contractor shall use the coring method for acceptance until the MPI is repaired or replaced and verified. Previous MPI locations shall be cored until three successive thickness differences between the two methods is equal to or less than 0.15 inches. If the MPI device is not able to be repaired or replaced within 10,000 sq yd of paving, the acceptance method will revert to coring acceptance from the last acceptable MPI measurement. A new process for pavement thickness will be started for the change in method of measurement.

The lower tolerance limit (TL) for pavement thickness shall be Plan Thickness (PT) minus 0.4 inches. This TL shall be used in the formulas in Section 105 for Incentive and Disincentive Payments (I/DP), Quality Levels (QL) and Pay Factor (PF) determinations. Any pavement thickness test value that exceeds the PT by more than 1.0 inch shall be assigned a value of PT +1.0 inch for the purpose of calculating the QL, PF and I/DP.

MPI test locations shall be determined by a random procedure so that each area has a randomly selected coring location. A MPI test plate will be installed before paving. The location of the MPI test plate shall be at least 4 feet from any dowel bar locations, tie bar location and utility box cover locations. The operator of the MPI device should use composite safety boots to not interfere with the device.

Where the new PCCP overlays an existing roadway, MPI test locations shall be determined by a stratified random procedure in the longitudinal direction and by the point of minimum required thickness in the lateral direction as shown in the plans. If existing field conditions show a condition where the point of minimum thickness in the lateral direction as shown in the plans is not appropriate, the Contractor shall identify the location and extent of the area to the Engineer at least 24 hours before paving. The Engineer may exclude this area from pavement thickness measurements for incentive and disincentive payments.

Pavement thickness tests will be evaluated per subsection 105.06. Additional cores will be taken at the direction of the Engineer at the contractor's expense as follows:

One additional core at the location of each process control (PC) test that is less than PT minus 1.0 Inch.

(1) If the length of the additional core is greater than PT minus 1.0 inch, no additional actions will be taken and the core test result will replace the MPI result to compute I/DP

(2) If the length of the additional core is less than PT minus 1.0 inch the area represented by this PC test shall become a separate process and will not be used to compute an I/DP. The thickness of the pavement in this area will be determined by taking cores. Cores shall be taken at intervals of 15 feet or less, parallel to the centerline in each direction from this location until two consecutive cores are found in each direction which are not less than PT minus 1.0 inch. The pavement found to be less than PT minus 1.0 inch shall be removed and replaced at the Contractor's expense.

When the removal and replacement have been completed, four additional randomly selected cores will be taken within the area represented by this core. The four additional cores will be used to compute an I/DP per subsection 105.06.

The Contractor shall repair all core holes by filling them with an approved non-shrink high-strength grout.

October 1, 2021

REVISION OF SECTION 107
WATER QUALITY CONTROL
(Under One Acre of Disturbance)

NOTICE

This is a project special provision that revises or modifies CDOT's *Standard Specifications for Road and Bridge Construction*. It has gone through a formal review and approval process and has been issued by CDOT's Construction Engineering Services Branch with formal instructions for its use on CDOT construction projects. It is to be used as written without change. Do not use modified versions of this special provision on CDOT construction projects, and do not use this special provision on CDOT projects in a manner other than that specified in the instructions unless such use is first approved by CDOT's Standards and Specifications Unit. The instructions for use on CDOT construction projects appear below.

Other agencies which use the *Standard Specifications for Road and Bridge Construction* to administer construction projects may use this special provision as appropriate and at their own risk.

Instructions for use on CDOT construction projects:
Use on all projects not having a Federal, State or Local Stormwater Construction Permit.
[Projects with less than one acre of disturbance and not part of a common plan of development].

REVISION OF SECTION 107
WATER QUALITY CONTROL
(Under One Acre of Disturbance)

Section 107.25 of the Standard Specifications is hereby deleted and replaced as follows:

107.25 Water Quality Control. The project work shall be performed using practices (including but not limited to those listed below) that minimize the pollution of any State waters, including wetlands.

(a) Definitions.

(1) Areas of Disturbance (AD). Locations where any activity has altered the existing soil cover or topography, including vegetative and non-vegetative activities during construction.

(2) Construction Site Boundary/Limits of Construction (LOC). The project area defined by the Environmental Clearance document.

(3) Discharge of Pollutants. One or more pollutants leaving the Limits of Construction (LOC) or entering State waters or other conveyances.

(4) Limits of Disturbed Area (LDA). Proposed limits of ground disturbance as shown on the Plans.

(5) Pollutant. Dredged spoil, dirt, slurry, solid waste, incinerator residue, sewage, sewage sludge, garbage, trash, chemical waste, biological nutrient, biological material, radioactive material, heat, wrecked or discarded equipment, rock, sand, or any industrial, municipal, or agricultural waste, as defined in the Colorado Code of Regulations (CCR) [5 CCR 1002-61, 2(76)]

(6) Pollution. Man-made, man-induced, or natural alteration of the physical, chemical, biological, and radiological integrity of water. [25-8-103 (16), CRS]

(7) State waters. Defined in Section 101.

(b) Construction Requirements

The Contractor shall comply with the “Colorado Water Quality Control Act” (Title 25, article 8, CRS), the “Protection of Fishing Streams” (Title 33, Article 5, CRS), the “Clean Water Act” (33 USC 1344), regulations promulgated, certifications or permits issued, and to the requirements listed below. In the event of conflicts between these requirements and water quality control laws, rules, or regulations of other Federal, or State agencies, the more restrictive laws, rules, or regulations shall apply.

If the Contractor determines construction of the project will result in a change to the activities or LDA, the Contractor shall detail the changes in a written report to the Engineer. Upon receipt of the report, the Engineer will coordinate with the Region Planning and Environmental Manager (RPEM) regarding the change. The Engineer, within five days after receipt of the report, will approve or reject in writing the request for change. If approved, the Engineer will detail a course of action including revision of existing permits or obtaining new permits.

If construction activities result in noncompliance of any permit requirement, the project will be suspended and the permitting agency notified, if required. The project will remain suspended until the Engineer receives written approval by the permitting agency.

The Contractor is legally required to obtain all permits associated with project specific water quality activities within, or off the Right of Way, such as borrow pits, concrete or asphalt plant sites, waste disposal sites, or other facilities. It is the Contractor’s responsibility to obtain these permits. The Contractor shall consult with the Engineer, and contact the Colorado Department of Public Health and Environment (CDPHE) or other appropriate federal, state, or local agency to determine the need for any permit.

REVISION OF SECTION 107
WATER QUALITY CONTROL
(Under One Acre of Disturbance)

The Contractor shall conduct the work in a manner that prevents pollution of any adjacent State waters, as defined in section 101. Erosion control work shall be performed in accordance with Section 208, this subsection, and all other applicable parts of the Contract.

Prior to construction, the Stormwater Management Plan (SWMP) Administrator, identified in Section 208, shall identify and describe all potential pollutant sources, including materials and activities, and evaluate them for the potential to contribute pollutants to stormwater discharges associated with construction activities. The list of potential pollutants shall be continuously updated during construction. At a minimum, each of the following shall be evaluated for the potential for contributing pollutants to stormwater discharges and identified in the SWMP, as described in Section 208:

(1) All exposed and stored soils.

(2) Vehicle tracking of sediments.

(3) Management of contaminated soils.

(4) Vehicle and equipment maintenance and fueling.

(5) Outdoor storage activities (building materials, fertilizers, chemicals, etc.).

(6) Significant dust or particle generating processes.

(7) Routine maintenance involving fertilizers, pesticides, detergents, fuels, solvents, oils, etc.

(8) On-site waste management practices (waste piles, dumpsters, etc.).

(9) Dedicated asphalt and concrete batch plants.

(10) Concrete truck and equipment washing, including the concrete truck chute and associated fixtures and equipment.

(11) Concrete placement and finishing tool cleaning.

(12) Non-industrial waste sources that may be significant, such as worker trash and portable toilets.

(13) Loading and unloading operations.

(14) Other areas or procedures where spills could occur.

The SWMP Administrator shall record the location of potential pollutants on the site map, if applicable. Descriptions of the potential pollutants shall be added to the SWMP.

Prior to construction the Contractor shall submit a Spill Response Plan for any petroleum products, chemicals, solvents, or other hazardous materials in use, or in storage, at the work site. See Section 208 for Spill Response Plan requirements. Work shall not be started until the plan has been submitted to and approved by the Engineer.

On site above ground bulk storage containers with a cumulative storage shell capacity greater than 1,320 U.S. gallons, or storage containers having a “reasonable expectation of an oil discharge” to State waters, are subject to the Spill Prevention, Control and Countermeasure Plan (SPCC) Rule. Oil of any type and in any form is covered, including, but not limited to: petroleum; fuel oil; sludge; oil refuse; oil mixed with wastes other than dredged spoil. EPA Region 8 is responsible for administering and enforcing the SPCC plan requirements in Colorado. Prior to start of work, the Contractor shall submit a SPCC Form, if applicable, which has been approved by the EPA for the project.

The Contractor shall obtain a Construction Dewatering (CDW) permit from CDPHE anytime

uncontaminated groundwater, including groundwater that is commingled with stormwater or surface water, is encountered during construction activities and the groundwater or commingled water needs to be discharged to State waters. If contaminated groundwater is encountered, a Remediation permit may be needed from CDPHE in accordance with Section 250.

Water from dewatering operations shall not be directly discharged into any State waters, unless allowed by a permit. Water from dewatering shall not be discharged into a ditch unless:

1. Written permission is obtained from the owner of the ditch.

2. It is covered in the approved CDW or Remediation Permit that allows the discharge.

3. A copy of this approval is submitted to the Engineer. A copy of the Permit shall be submitted to the Engineer prior to dewatering operations commencing.

Construction Dewatering may be discharged to the ground on projects where CDPHE's Low Risk Guidance Document for Discharges of Uncontaminated Groundwater to Land are met. The conditions of this guidance are:

1. The source of the discharge is solely uncontaminated groundwater or uncontaminated groundwater combined with stormwater and does not contain pollutants in concentrations that exceed water quality standards for groundwater referenced above.

2. Discharges from vaults or similar structures shall not be contaminated. Potential sources of contamination include process materials used, stored, or conveyed in the structures, or introduced surface water runoff from outside environments that may contain oil, grease, and corrosives.

3. The groundwater discharge does not leave the project boundary limits where construction is occurring.

4. Land application is conducted at a rate and location that does not allow for any runoff into State waters or other drainage conveyance systems, including but not limited to streets, curb and gutter, inlets, borrow ditches, open channels, etc.

5. Land application is conducted at a rate that does not allow for any ponding of the groundwater on the surface, unless the ponding is a result of implementing control measures that are designed to reduce velocity flow. If the control measures used result in ponding, the land application shall be done in an area with a constructed containment, such as an excavation or berm area with no outfall. The constructed containment shall prevent the discharge of the ponding water offsite as runoff.

6. A visible sheen is not evident in the discharge.

7. Control measures are implemented to prevent any sediment deposited during land application from being transported by stormwater runoff to surface waters or other conveyances.

8. All control measures used shall be selected, installed, implemented, and maintained according to good engineering, hydrologic, and pollution control practices. The selected control measures shall provide control for all potential pollutant sources associated with the discharge of uncontaminated groundwater to land. The discharge shall be routed in such a way that it will not cause erosion to land surface. Energy dissipation devices designed to protect downstream areas from erosion by reducing the velocity of flow (such as hose attachments, sediment and erosion controls) shall be used

when necessary to prevent erosion.

All dewatering operations shall be recorded in the SWMP as follows:

1. The source is identified in the SWMP and updated by the Contractor.

2. The SWMP describes and locates the practices implemented at the site to control stormwater pollution from the dewatering of groundwater or stormwater.

3. The SWMP describes and locates the practices to be used that will ensure that no groundwater from construction dewatering is discharged from the LOC as surface runoff or to surface waters or storm sewers.

4. Groundwater and groundwater combined with stormwater do not contain pollutants in concentrations exceeding the State groundwater standards in Regulations 5 CCR 1002-41 and 42.

If surface waters are diverted around a construction area and no pollutants are introduced during the diversion, a CDW Permit is not required. If the diverted water enters the construction area and contacts pollutant sources (e.g. disturbed soil, concrete washout, etc.), the Contractor shall obtain a CDW permit for the discharge of this water to State waters or to the ground.

At least 15 days prior to commencing dredging or fill operations in a watercourse, the Contractor shall provide written notification to owners or operators of domestic or public water supply intakes or diversion facilities, if these facilities are within 20 miles downstream from the dredging or fill operations. Notification shall also be given to Owners or operators of other intakes or diversions that are located within five miles downstream from the site of the project. Identities of downstream owners and operators can be obtained from Colorado Division of Water Resources, Office of the State Engineer.

Temporary fill into wetlands or streams shall not be allowed, except as specified in the Contract and permits. If such work is allowed, upon completion of the work all temporary fills shall be removed in their entirety and disposed of in an upland location outside of flood plains unless otherwise specified in the Contract.

Construction operations in waters of the United States as defined in 33 CFR Part 328.3, including wetlands, shall be restricted to areas and activities authorized by the U.S. Army Corps of Engineers as shown in the Contract. Fording waters shall be allowed only as authorized by the U.S. Army Corps of Engineers 404 Permit. Wetland areas outside of the permitted limits of disturbance shall not be used for storage, parking, waste disposal, access, borrow material, or any other construction support activity.

Pollutant byproducts of highway construction, such as concrete, asphalt, solids, sludges, pollutants removed in the course of treatment of wastewater, excavation or excess fill material, and material from sediment traps shall be handled, stockpiled, and disposed of in a manner that prevents entry into State waters, including wetlands. Removal of concrete waste and washout water from mixer trucks, concrete finishing tools, concrete saw, and all concrete material removed in the course of construction operations or cleaning shall be performed in a manner that prevents waste material from entering State waters and shall not leave the site as surface runoff. A minimum of ten days prior to the start of the construction activity, the Contractor shall submit in writing a Method Statement for Containing Pollutant Byproducts to the Engineer for approval.

The use of chemicals such as soil stabilizers, dust palliatives, herbicides, growth inhibitors, fertilizers, deicing salts, etc., shall be in accordance with the manufacturer’s recommended application rates, frequency, and instructions.

REVISION OF SECTION 107
WATER QUALITY CONTROL
(Under One Acre of Disturbance)

All materials stored on-site shall be stored in a neat, orderly manner, in their original containers, with the original manufacturer's label. Materials shall not be stored in a location where they may be carried into State waters at any time.

Spill prevention and containment measures conforming to Section 208 shall be used at storage, and equipment fueling and servicing areas to prevent the pollution of any State waters, including wetlands. All spills shall be cleaned up immediately after discovery, or contained until appropriate cleanup methods can be employed. Manufacturer's recommended methods for spill cleanup shall be followed, along with proper disposal methods. When required by the Colorado Water Quality Control Act, Regulation 5 CCR 1002-61, spills shall be reported to the Engineer and CDPHE in writing.

The Contractor shall prevent construction activities from causing grass or brush fires.

The construction activities shall not impair Indian tribal rights, including, but not limited to, water rights, and treaty fishing and hunting rights.

Prior to start of work, the Contractor shall certify in writing to the Engineer that construction equipment has been cleaned prior to initial site arrival. Vehicles and equipment shall be free of soil and debris capable of transporting noxious weed seeds or invasive species onto the site. Additional equipment required for construction shall also be certified prior to being brought onto the project site.

Vehicles which have been certified by the Contractor as having been cleaned prior to arrival on site may be cleaned on site at an approved area where wash water can be properly contained. Vehicles leaving and reentering the project site shall be recertified.

At the end of each day the Contractor shall collect all trash and dispose of it in appropriate containers.

All construction site wastes shall be properly managed to prevent potential pollution of State waters. Construction waste that is considered a pollutant or contaminant shall be collected and disposed of in appropriate containers. This material may be stockpiled on the project when it is contained or protected by an appropriate control measure.

Discharges from the project area shall not cause, have the reasonable potential to cause, or measurably contribute to an exceedance of any applicable water quality standard, including narrative standards for water quality.

Stormwater Construction Permit. A Colorado Discharge Permit System Stormwater Construction Permit (CDPS-SCP) is not required for this project. A CDPS-SCP will be obtained from CDPHE, if any of the following activities apply:

(1) Construction sites that will disturb one acre or more; or

(2) Construction sites that are part of a common plan of development or sale; or

(3) It is specified in the contract; or

Stormwater discharges that are designated by the division as needing a stormwater permit because the discharge:

1. Contributes to a violation of a water quality standard; or

2. is a significant contributor of pollutants to State waters.

Dewatering, erosion control for dewatering, and disposal of water resulting from dewatering operations,

including all costs for permits, will not be measured and paid for separately, but shall be included in the work.

The Contractor shall be liable for any penalty (including monetary fines) applied to the Department caused by the Contractor's noncompliance with any water quality permit or certification. Monetary fines shall be deducted from any money due to the Contractor. If the monetary fine is in excess of all the money due to the Contractor, then the Contractor shall pay to the Department the amount of such excess.

The Contractor shall not receive additional compensation, or time extensions, for any disruption of work or loss of time caused by any actions brought against the Contractor for failure to comply with good Engineering, hydrologic and pollution control practices.

If a spill occurs as a direct result of the Contractor's actions or negligence, the cleanup of such spill shall be performed by the Contractor at the Contractor's expense.

Areas exposed to erosion by fire resulting from the Contractor's operations shall be stabilized in accordance with Section 208 by the Contractor, at the Contractor's expense.

March 18, 2022

REVISION OF SECTION 108
EXTENSION OF CONTRACT TIME

NOTICE

This Standard Special Provision (SSP) revises or modifies CDOT's *Standard Specifications for Road and Bridge Construction*. These are the official instructions for its use on CDOT construction projects, and the Construction Engineering Services Branch has reviewed, approved, and issued it. Use as written without change. Do not use modified versions of this SSP on CDOT construction projects. Do not use this special provision on CDOT projects in a manner other than specified in the instructions without approval by CDOT's Standards and Specifications Unit. The instructions for use appear below.

Other agencies using the *Standard Specifications for Road and Bridge Construction* to administer construction projects may use this special provision appropriately and at their own risk.

Instructions for use on CDOT construction projects:
Use on all projects.

REVISION OF SECTION 108
EXTENSION OF CONTRACT TIME

Revise Sections 108 of the Standard Specifications as follows:

Add the following to Subsection 108.08(d):

(d) *Extension of Contract Time.* The Contractor shall orally notify the Engineer as soon as the Contractor recognizes a potential project delay. The Contractor or Engineer shall document the discussion in writing. This discussion and documentation are not considered an official notice of a delay.

The Contractor shall provide a written notice of delay within seven days of determining the need for additional contract time. The notice of delay shall describe the nature and specific cause of the delay. Failure to submit the written notice of delay within seven days constitutes a waiver of entitlement to additional time or compensation.

The Contractor shall submit the time extension request and supporting analysis within 30 days of the written delay notice. The request shall include a schedule analysis with all information needed to support the time extension request pursuant to one of the following methods including an explanation for selecting that method:

(1) Time Impact Analysis (TIA) for all forward-looking analyses of time impacts following the guideline AACE® International Recommended Practice No. 52R-06 Prospective Time Impact Analysis – As Applied in Construction.

(2) Forensic Schedule Analysis for all time impacts absorbed into the schedule following the AACE® International Recommended Practice 29R-03 Forensic Schedule Analysis.

(3) Other acceptable method of schedule analysis, as approved by the Engineer.

The analyses shall show a delay to the critical path in order to obtain a contract time extension. The Contractor shall demonstrate that efforts were made to avoid the delay by resequencing the work or by using other reasonable alternatives. Failure to submit the documentation to support the time extension request within 30 days of the Contractor's written notice of delay constitutes a waiver of entitlement to additional time or compensation. The Engineer's review of the time extension request will not exceed 15 days.

October 1, 2021

REVISION OF SECTION 109
ASPHALT CEMENT COST ADJUSTMENT
(ASPHALT CEMENT INCLUDED IN THE WORK)

NOTICE

This is a standard special provision that revises or modifies CDOT's *Standard Specifications for Road and Bridge Construction.* It has gone through a formal review and approval process and has been issued by CDOT's Project Development Branch with formal instructions for its use on CDOT construction projects. It is to be used as written without change. Do not use modified versions of this special provision on CDOT construction projects, and do not use this special provision on CDOT projects in a manner other than that specified in the instructions unless such use is first approved by the Standards and Specifications Unit of the Project Development Branch. The instructions for use on CDOT construction projects appear below.

Other agencies which use the *Standard Specifications for Road and Bridge Construction* to administer construction projects may use this special provision as appropriate and at their own risk.

Instructions for use on CDOT construction projects:

- Use this standard special provision in all projects with items 403 Hot Mix Asphalt and/or 403 Stone Matrix Asphalt in which the cost of AC is included in the work.
- The designer should add a Planned Force Account item called F/A Asphalt Cement Cost Adjustment, Pay Item 700-70019 to the plans and project special provisions to account for the possibility that an adjustment will be required. The amount of this Force Account item to be included in the project budget can be calculated using the AC Cost Adjustment Worksheet provided on the Design and Construction Support - Asphalt Cement Cost Adjustment website. Input the following data in the worksheet:
    - Price index for the current month (BP)
    - BP + 10%
    - Estimated Percent AC to be in the mix in decimal, i.e. 0.1 for 10%
    - Planned tonnage
        - This will calculate an estimated dollar amount assuming a 10% increase in price. This should be used as the minimum FA budget amount.
    - Follow the same instructions but use BP + 50% for the estimated maximum amount the project would pay in AC Cost Adjustment
        - This will calculate an estimated dollar amount assuming a 50% increase in price. This should be used as the maximum FA budget amount.
    - The Region may determine an amount between these two figures for the final FA budget amount.
- Contact your Area Engineer if you have any questions.
- If the amount of actual Asphalt Cement Adjustments exceeds the funding allotted in the Planned Force Account, the remainder of the adjustments should be made using funding from Minor Contract Revisions (MCRs), or by adding funding to the project.

REVISION OF SECTION 109
ASPHALT CEMENT COST ADJUSTMENT
(ASPHALT CEMENT INCLUDED IN THE WORK)

Section 109 of the Standard Specifications is hereby revised for this project as follows:
Delete subsection 109.06 (j) and replace with the following:

(j) *Asphalt Cement Cost Adjustments.* Contract cost adjustments will be made to reflect increases or decreases in the monthly average price of asphalt cement from the average price for the month preceding the month in which bids were received for the Contract. These cost adjustments are not a change to the contract unit prices bid. When bidding, the Contractor shall specify on the Form 85 whether the cost adjustment will apply to the Contract. After bids are submitted, the Contractor will not be given the opportunity to accept or reject this adjustment. If the Contractor fails to indicate a choice on the Form 85, the cost adjustment will not apply to the Contract. If the asphalt cement cost adjustment is accepted by the Contractor, the adjustment will be made in accordance with the following criteria:

Abbreviations and Terms

1. Estimate Price for asphalt (EP) – Average Asphalt Cement price index for the calendar month prior to the calendar month in which the partial estimate pay period ends.

   a. On the first Monday of each month, the Department determines the EP using price values from the most recent **Poten & Partners Asphalt Weekly** and the **Argus Americas Asphalt Report**. The Department averages values for the following, eliminating the single highest and single lowest values, before averaging.

      The high reported selling price (per ton) of typical non-modified paving grades of asphalt from the **Poten and Partners Asphalt Weekly Monitor**.

      Colorado
      - Colorado Springs Area

      Montana
      - Eastern markets
      - Western markets

      Nebraska
      - Western markets

      New Mexico
      - Northern
      - Southern

      Utah
      - Salt Lake City area

      Wyoming
      - Northern markets
      - Southern markets

      The high reported selling price (per ton) of typical non-modified paving grades of asphalt from the **Argus Americas Asphalt Report**.

      Denver

      Kansas City

      Omaha

      Salt Lake City

      Wyoming

      This average value is then averaged with values obtained in the same manner for the previous three weekly reports to establish the EP.

   b. The EP remains in effect until the first Monday of the following month and is used for regular partial estimates closed before the first Monday of the following month.

2. Base Price for asphalt (BP) – Average Asphalt Cement price index for the calendar month prior to the calendar month in which bids are opened.

REVISION OF SECTION 109
ASPHALT CEMENT COST ADJUSTMENT
(ASPHALT CEMENT INCLUDED IN THE WORK)

3. Asphalt cost adjustment (ACCA) – Asphalt Cement Cost Adjustment.
https://www.codot.gov/business/designsupport/cdot-construction-specifications/2021-construction-specifications/acca/acca

1. Cost adjustments will be made on a monthly basis subject to the following conditions:

A. Adjustment will be based on the pay quantities on the monthly partial pay estimate for the following two pay items when measured by the ton and asphalt cement is included in the pay items:

Item No.	Item	Pay Unit
403*	Hot Mix Asphalt (Grading __) (Asphalt)	Ton
403	Stone Matrix Asphalt (Grading __) (Asphalt)	Ton
*Hot Mix Asphalt (Patching) is not subject to asphalt cement cost adjustment.		

B. A cost adjustment will be made only when the EP asphalt cement price index varies by more than 10 percent from the BP asphalt cement price index, and only for that portion of the variance in excess of 10 percent. Cost adjustments may be either positive or negative dollar amounts.

C. The maximum allowable monthly and final price adjustment to the Contractor or rebate to The Department is limited to a (EP/BP) ratio of 1.6 and 0.4, respectively.

D. Asphalt cement cost adjustments will not be made for any partial estimate falling wholly after the expiration of contract time.

E. Adjustment formula:

EP greater than BP:

$$ACCA = (EP - 1.10\ BP)\ (PA)\ (Q)$$

EP less than BP:

$$ACCA = (EP - 0.90\ BP)\ (PA)\ (Q)$$

Where:

BP = Average Asphalt Cement price index for the calendar month prior to the calendar month in which bids are opened

EP = Average Asphalt Cement price index for the calendar month prior to the calendar month in which the partial estimate pay period ends

ACCA = Asphalt Cement Cost Adjustment

PA = Percent of the paving mixture that is asphalt cement. Asphalt Cement content will be determined by the weighted average of all asphalt cement content percentages obtained from the field acceptance tests for that item (Use decimal in formula, e.g.: 0.053). If Reclaimed Asphalt Pavement (RAP), Reclaimed Asphalt Shingles (RAS), or both is used, the percent of Virgin Asphalt Cement added to the mix will be determined by subtracting the percent of asphalt cement in the RAP, RAS, or both from the percent of asphalt cement in the mix as calculated from Revision of Section 401, Reclaimed Asphalt Pavement and Revision of Section 401 Reclaimed Asphalt Shingles.

Q = Pay quantity for all 403 items shown above on the monthly partial pay estimate in Tons.

Example: Bids are opened on July 16. The BP will be the average of the weekly postings for June 1 through June 30. For an estimate cut-off date selected by the Contractor at the Pre-Construction Conference of the 20th of the month a February estimate will include HMA quantities measured from the 21st of January through the 20th of February, and the EP index used to calculate ACCA will be the average of the weekly prices for January 1 through January 31 as established by CDOT.

F. Cost adjustment will not be made for the quantity of any item that is left in place at no pay or for material removed and replaced at the Contractor's expense.

G. Cost adjustments will not be made to items of work added to the Contract by Change Order after the award of the Contract.

H. The asphalt cement cost adjustment will be the sum of the individual adjustments for each of the pay items shown above. No adjustment will be made for asphalt cement costs on items other than those shown above.

I. Asphalt cement cost adjustments resulting in an increased payment to the Contractor will be paid for under the planned force account item: Asphalt Cement Cost Adjustment. Asphalt cement cost adjustments resulting in a decreased payment to the Contractor will be deducted from monies owed the Contractor.

October 1, 2021

REVISION OF SECTION 207
TOPSOIL

NOTICE

This is a standard special provision that revises or modifies CDOT's *Standard Specifications for Road and Bridge Construction.* It has gone through a formal review and approval process and has been issued by CDOT's Project Development Branch with formal instructions for its use on CDOT construction projects. It is to be used as written without change. Do not use modified versions of this special provision on CDOT construction projects, and do not use this special provision on CDOT projects in a manner other than that specified in the instructions unless such use is first approved by CDOT's Standards and Specifications Unit. The instructions for use on CDOT construction projects appear below.

Other agencies which use the *Standard Specifications for Road and Bridge Construction* to administer construction projects may use this special provision as appropriate and at their own risk.

Instructions for use on CDOT construction projects:

Use in projects having earthwork disturbances that will be stabilized with vegetation.

REVISION OF SECTION 207
TOPSOIL

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.

October 1, 2021

REVISION OF SECTION 208
EROSION CONTROL
(Under One Acre of Disturbance)

NOTICE

This is a project special provision that revises or modifies CDOT's *Standard Specifications for Road and Bridge Construction*. It has gone through a formal review and approval process and has been issued by CDOT's Construction Engineering Services Branch with formal instructions for its use on CDOT construction projects. It is to be used as written without change. Do not use modified versions of this special provision on CDOT construction projects, and do not use this special provision on CDOT projects in a manner other than that specified in the instructions unless such use is first approved by CDOT's Standards and Specifications Unit. The instructions for use on CDOT construction projects appear below.

Other agencies which use the *Standard Specifications for Road and Bridge Construction* to administer construction projects may use this special provision as appropriate and at their own risk.

Instructions for use on CDOT construction projects:
Use on all projects not having a Federal, State or Local Stormwater Construction Permit.
[Projects with less than one acre of disturbance and not part of a common plan of development].

REVISION OF SECTION 208
EROSION CONTROL
(Under One Acre of Disturbance)

Section 208 of the Standard Specifications is hereby deleted and replaced with the following:

DESCRIPTION

208.01 This work consists of constructing, installing, maintaining, and removing when required, control measures during the life of the Contract to prevent or minimize erosion, sedimentation, and pollution of any State waters as defined Section 101.

Stormwater runoff from all disturbed areas and soil storage areas for which permanent or interim stabilization is not implemented, must flow to at least one control measure to minimize sediment in the discharge. This shall be accomplished through filtering, settling, or straining. The control measure shall be selected, designed, installed, and adequately sized in accordance with good engineering, hydrologic, and pollution control practices. The control measures shall contain or filter flows in order to prevent the bypass of flows without treatment and shall be appropriate for stormwater runoff from disturbed areas and for the expected flow rate, duration, and flow conditions (i.e., sheet or concentrated flow).

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

When a provision of Section 208 or an order by the Engineer requires that an action be immediate or taken immediately, it shall be understood that the Contractor shall at once begin affecting completion of the action and pursue it to completion in a manner acceptable to the Engineer.

MATERIALS

208.02 Erosion control materials are subject to acceptance in accordance with Section 106. Erosion control materials shall be subject to the following approval process:

Material	Approval Process	Notes:
Erosion Bales (Weed Free)	COC	The Contractor shall provide a transit certificate number or a copy of the transit certificate as supplied from the producer.
Silt Fence	COC	
Silt Berm	APL	
Erosion Log (Type 1, Type 2, and Type 3)	COC	
Silt Dikes	COC	
Pre-fabricated Concrete Washout Structures (above ground)	APL	
Pre-fabricated Vehicle Tracking Pad	APL	
Aggregate Bag	COC	
Storm Drain Inlet Protection (Type I, II, and III)	APL	
COC = Certificate of Compliance; APL= Approved Product List		

REVISION OF SECTION 208
EROSION CONTROL
(Under One Acre of Disturbance)

REVISION OF SECTION 208
EROSION CONTROL
(Under One Acre of Disturbance)

The material for control measures shall conform to the following:

(a) *Erosion Bales*. Material for erosion bales shall consist of Certified Weed Free hay or straw. The hay or straw shall be certified under the Colorado Department of Agriculture Weed Free Forage Certification Program and inspected as regulated by the Weed Free Forage Act, Title 35, Article 27.5, CRS. Each certified weed free erosion bale shall be identified by blue and orange twine binding the bales.

The Contractor shall not place certified weed free erosion bales or remove their identifying twine until the Engineer has inspected them.

The Contractor may obtain a current list of Colorado Weed Free Forage Crop Producers who have completed certification by contacting the:

Colorado Department of Agriculture, Weed Free Forage Program,
305 Interlocken Pkwy, Broomfield, CO 80021

Contact the Weed Free Forage Coordinator at (303) 869-9038. Also available at www.colorado.gov/ag/csd.

Bales shall be approximately 5 cubic feet of material and weigh at least 35 pounds. Stakes shall be wood and shall be 1.5 inch by 1.5 inch by 30 inch actual.

(b) *Silt Fence*. Silt fence posts shall be wood with a minimum length of 46 inches. Wood posts shall be 1.5-inch width by 1.5-inch thickness actual dimensions with 1/8-inch tolerance. Geotextile shall be attached to wood posts with three or more staples per post.

Silt fence geotextile shall conform to the following requirements:

Physical Requirements for Silt Fence Geotextiles

Property	Wire Fence Supported Requirements	Self-Supported Requirements Geotextile Elongation <50%	Test Method
Grab Strength, lbs.	90 minimum	124 minimum	ASTM D4632
Permittivity sec-1	0.05	0.05	ASTM D4491
Ultraviolet Stability	Minimum 70% Strength Retained	Minimum 70% Strength Retained	ASTM D4355

Silt Fence (Reinforced). Silt fence posts shall be metal "studded tee" T-post with a minimum length of 66 inches. Metal posts shall be “studded tee” with 0.095-inch minimum wall thickness. Wire fabric reinforcement for the silt fence geotextile shall be a minimum of 14 gauge with a maximum mesh spacing of 6 inches. Geotextile shall be attached to welded wire fabric with ties or nylon cable ties at 12 inches on center at top, middle and bottom wire. Welded wire fabric shall be attached to the post with a minimum three 12-gauge wire ties per post. Vinyl or rubber safety caps shall be installed on all T-post.

(c) *Temporary Berms*. Temporary berms shall be constructed out of compacted embankment (subsoil)

and not out of salvaged topsoil.

(d) *Temporary Slope Drains*. Temporary slope drains shall consist of fiber mats, plastic sheets, stone, concrete or asphalt gutters, half round pipe, metal or plastic pipe, wood flume, flexible rubber, or other materials suitable to carry accumulated water down the slopes. Outlet protection riprap shall conform to Section 506. Erosion control geotextile shall be a minimum Class 2, conforming to Section 712.

(e) *Silt Berm*. Silt berm shall consist of permeable multi-use material consisting of ultraviolet (UV) stabilized high-density polyethylene or other approved material effective in reducing water velocity. Designed and tested system shall be installed on a Turf Reinforcement Mat or Soil Retention Blanket in accordance with Section 216. The segment shall be secured to the ground with either metal or wood stakes. Minimum requirements for securing stakes shall be in accordance with the plans. Dimensions of individual segments shall meet the following criteria:

Width	6 - 11 inches
Height	6 - 10 inches
Weight	> 0.25 lbs./sq. ft.
Percent Open Area	20 – 50%

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

(g) *Sediment Trap*. In constructing an excavated sediment trap, excavated soil may be used to construct the dam embankment, provided the soil meets the requirements of Section 203. Outlet protection riprap shall be the size specified in the Contract and shall conform to Section 506. Erosion control geotextile shall be a minimum Class 1, conforming to Section 712.

(h) *Erosion Logs*. Erosion logs shall be one of the following types unless otherwise shown on the plans:

(1) Erosion Log (Type 1) shall consist of cylinder casings filled with curled aspen wood excelsior with a consistent width of fibers evenly distributed throughout the log. The casing shall be seamless, photo-degradable tube netting. The curled aspen wood excelsior shall be fungus free, resin free, and free of growth or germination inhibiting substances.

(2) Erosion Log (Type 2) shall consist of cylinder casings filled with Erosion Log (Type 2) Compost in accordance with Section 212. The compost-wood chip blend may be pneumatically shot into a geotextile cylindrical casing or be pre-manufactured. The geotextile casing shall consist of high density polyethylene (HDPE) or polypropylene mesh (knitted, not extruded) with openings of ⅛ to ⅜ inch and contain the compost-wood chip material while not limiting water infiltration.

(3) Erosion Log (Type 3) shall consist of cylinder casings filled with curled aspen wood excelsior with a consistent width of fibers evenly distributed throughout the log. The casing shall be seamless, 100 percent natural fiber cylinder netting (compostable) and shall have minimum dimensions as shown in Table 208-1, based on the diameter of the log shown on the plans. Netting shall be a woven cotton or cellulose base mesh that has an approval to compost certification with a maximum mesh size of 0.075 inches and index values as shown in Table 208-2. The curled aspen wood excelsior shall be fungus free, resin free, and free of growth or germination inhibiting substances.

Natural compostable fiber netting shall not contain any synthetic material woven into the netting such as polypropylene, nylon, polyethylene, or polyester dyes. Oxo-degradable or oxo-biodegradable petrochemical-based fiber shall not be part of the netting material. Burlap netting material shall not be used for Erosion Log (Type 3).

Erosion Log (Type 1, Type 2, and Type 3) shall have minimum dimensions as shown in Table 208-1, based on the specified diameter of the log.

Table 208-1
Dimensions of Erosion Logs

Diameter Type 1 & 3 (Inches)	Diameter Type 2 (Inches)	Length (feet)		Weight (minimum) (pounds/foot)	Stake Dimensions (Inches)
		Min.	Max.		
9	8	10	180	1.6	¾ thickness by ¾ width by 18 long
12	12	10	180	2.5	1.5 thickness by 1.25 width by 24 long
20	18	10	100	4.0	1.5 thickness by 1.25 width by 30 long

Wood stake acceptable tolerance +/- 1/8 inch.

Table 208-2
Index Values for Natural Fiber Netting

Property	Requirement	Test Method
Fabric Tensile Strength	>70 lbs.	ASTM D3822
Biodegradable	100%	ASTM D5988
Mesh Pattern	Rib	

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

(i) *Silt Dikes*. Silt dikes shall be pre-manufactured flexible sediment barrier that will fully rebound when driven over by heavy equipment. Material shall consist of outer geotextile fabric covering closed cell urethane or polyethylene foam core. The geotextile fabric aprons shall extend beyond the foam core a minimum of 8 inches on both sides.

Table 208-3
Geotextile Requirements

Property	Requirement	Test Method
Water Flow Rate	100-150 gallons per minute/square foot	ASTM D4491

Grab Breaking Load	200 lbs. minimum in each direction	ASTM D4632
Ultraviolet Degradation	70% of original unexposed grab breaking load after 500 hours	ASTM D4595

Each silt dike segment shall have the following dimensions:

Dimension	**Length**
Vertical height after installation	>5 inches
Geotextile sleeve section to interlock segments	>8 inches

Silt dike segments shall be anchored down using the minimum requirements shown in Table 208-4.

Table 208-4
Silt Dike Segment Requirements

Surface	Nail	Washers
Soil Surface	Installed in 4 inch deep trench with 6 inch nails no more than 4 feet O.C. (on center)	1 inch washers
Hard Surface	1 inch concrete nails no more than 4 feet O.C.	1 inch washers and solvent-free adhesive

(j) *Concrete Washout Structure*. The Contractor shall construct a washout structure that will contain washout from concrete placement, construction equipment cleaning operations, and residue from cutting, coring, grinding, grooving, and hydro-concrete demolition. Embankment required for the concrete washout structure may be excavated material, provided that this material meets the requirements of Section 203 for embankment. If the bottom of the excavated structure is within 5 feet of anticipated high ground water elevation or the soil does not have adequate buffering capacity to meet water quality standards, an impermeable synthetic liner shall be installed with the minimum properties shown in Table 208-5.

Table 208-5
Impermeable Synthetic Liner Requirements

Tested Property	Test Method	Units	Value
Thickness	ASTM D5199	mil	>30 +/- 1.5
Tear Strength	ASTM D1004	lbs.	>8
Low Temperature Impact	ASTM D1790	°F	Pass at -20

(k) *Pre-Fabricated Concrete Washout Structure.* Pre-Fabricated Concrete Washout Structures shall be one of the following types unless otherwise shown on the plans:

(1) Pre-Fabricated Concrete Washout Structure (Type 1). Type 1 portable bins shall be used only when specified in the Contract. It shall consist of a watertight multi-use container designed to contain liquid concrete washout wastewater, solid residual concrete waste from washout operations, and residue from saw cutting, coring, grinding, grooving, and hydro-concrete

demolition. Minimum capacity including freeboard shall be 440 gallons.

(2) Pre-Fabricated Concrete Washout Structure (Type 2). Type 2 portable bins shall be used only when specified in the Contract. It shall consist of a watertight one-time use container designed to contain liquid concrete washout wastewater, solid residual concrete waste from washout operations, and residue from saw cutting, coring, grinding, grooving, and hydro-concrete demolition. The structure shall have a system to secure to the ground. Minimum capacity including freeboard shall be 50 gallons.

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

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

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

Erosion control geotextile shall be a minimum Class 2, conforming to Section 712.

Pre-Fabricated or manufactured vehicle tracking pads shall only be used if specified in the Contract. Multi-use pads shall consist of industrial grade materials and shall be designed to minimize sediment leaving the project.

Minimum dimensions of the modular systems shall be:

Width	12 feet
Length of pad	35 feet

To accommodate construction traffic turning radii between the tracking pad and a stabilized surface, additional flared sections of approved pads or aggregate in accordance with this specification shall be used at no additional cost to CDOT.

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

If pads weigh less than 8 pounds per square foot, an anchoring system approved by the manufacturer shall be used for pads placed on soil and hard surfaces.

A thin layer of stone, geotextile, or other stable surface may be required to stop rutting under the pad or area where the vehicles mount or dismount the manufactured trackout control device.

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

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

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

Crushed stone contained in the aggregate bags shall conform to Table 703-1 for Coarse Aggregate No. 6.

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

Property	Requirement	Test Method
Grab Tensile Strength	90 lbs. min.	ASTM D4632
Trapezoid Tear Strength	25 lbs. min.	ASTM D4533
Mullen Burst	300 psi	ASTM D3786
Ultraviolet Resistance	70%	ASTM D4355

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

Storm Drain Inlet Protection Properties	Protection Types		
	Type I[1]	Type II[2]	Type III[3]
Diameter	4 in.	4 in.	N/A
Minimum Section Length	7 ft.	5 ft.	5 ft.
Apron Insert	---	30 in. or sized to grate	30 in or sized to grate

[1]Type I protection shall be used with Inlet Type R.
[2]Type II protection shall be used with Combination Inlet. Option A or B
[3]Type III protection shall be used with Vane Grate Inlet only. Option A or B
Note: Options A and B are shown on Standard Plan M-208-1.

The Storm Drain Inlet Protection (Type I, II and III) shall consist of a woven geotextile fabric with the following properties:

Property	Test Method	Unit	Requirement
Grab tensile strength	ASTM D4632	lbs.	minimum 150X200
Mullen Burst Strength	ASTM D3786	lbs.	400

Trapezoid Tear Strength	ASTM D4533	lbs.	minimum 60X60
Percent Open Area	COE-22125-86	%	≥20
Water Flow Rate	ASTM D4491	gal./min./sq. ft.	≥100
Ultraviolet Resistance	ASTM D4355	%	≥70

Curb roll for Storm Drain Inlet Protection (Type I and II) shall have a weight >4 pounds per linear foot of device. The device shall be capable of conforming to the shape of the curb. Aggregate contained in the storm drain inlet device shall consist of gravel or crushed stone conforming Table 703-1 for Coarse Aggregate No. 6.

CONSTRUCTION REQUIREMENTS

208.03 Project Review, Schedule, and Erosion Control Management. Prior to construction the Contractor shall implement control measures in accordance with the approved project schedule as described in this section.

At the Pre-Construction Conference, the attendees shall discuss the Stormwater Management Plan (SWMP), maintaining water quality standards, sensitive habitats on-site, wetlands, other vegetation to be protected, and the enforcement mechanisms for not meeting the requirements of this specification. Prior to beginning construction, the Contractor shall evaluate the project site for storm water draining into or through the site. When such drainage is identified, control measures shall be used if possible to divert stormwater from running on-site and becoming contaminated with sediment or other pollutants. The diversion may be accomplished with a temporary pipe or other conveyance to prevent water contamination or contact with pollutants. Run-on water that cannot be diverted shall be treated as construction runoff and adequate control measures shall be employed.

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

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

Prior to construction, the Contractor shall implement appropriate control measures for protection of wetlands, sensitive habitat, and existing vegetation from ground disturbance and other pollutant sources, in accordance with the approved project schedule as described in Section 208.

When additional control measures are required and approved by the Engineer, the Contractor shall implement the additional control measures and the SWMP Administrator shall record and describe them on the SWMP site map. The approved control measures will be measured and paid for in accordance with Section 208.

(a) *Project Review*. The Contractor shall submit modifications to the Contractor's control measures or SWMP in a written proposal to the Engineer. The written proposal shall include the following

information:

(1) Reasons for changing the control measures.

(2) Diagrams showing details and locations of all proposed changes.

(3) List of appropriate pay items indicating new and revised quantities.

(4) Schedules for accomplishing all erosion and sediment control work.

(5) Effects on certifications caused by the proposed changes.

The Engineer will approve or reject the written proposal in writing within seven days after receipt of the submittal. The Engineer may require additional control measures prior to approving the proposed modifications. Additional modifications and additional control measures will be paid for at the Contract Unit Price for the specific items involved. If no items exist, they will be paid for as extra work in accordance with Section 109.

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

(c) *Erosion Control Management (ECM).* Erosion Control Management for this project shall consist of SWMP Administration and Erosion Control Inspection. All ECM staff shall have working knowledge and experience in construction, and shall have successfully completed the Transportation Erosion Control Supervisory Certificate Training (TECS) as provided by the Department. The Superintendent may be permitted to serve in an ECM role, unless otherwise specified in the contract.

1. SWMP Administration. The SWMP shall be maintained by a SWMP Administrator. The name of the SWMP Administrator shall be recorded on the SWMP. The SWMP Administrator shall have full responsibility to maintain and update the SWMP and identify all critical action items needed to maintain water quality standards:

(1) Complete the SWMP as described in Section 208.

(2) Participate in the Pre-Construction Conference.

(3) Attend erosion and sediment control meetings.

(4) Implement necessary actions to reduce erosion or water quality problems, anticipated or presently existing, resulting from construction activities.

(5) Ensure that all labor, material, and equipment needed to install, maintain, and remove control

measures are available as needed.

(6) During construction, the SWMP site map shall be updated to reflect current field conditions and include, at a minimum, the following if applicable:

(i) Limits of Construction (LOC).

(ii) Areas of disturbance (AD), including areas of borrow and fill.

(iii) Limits of Disturbance (LDA).

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

(v) Location of dedicated asphalt, concrete batch plants, and masonry mixing stations.

(vi) Location of construction offices and staging areas.

(vii) Location of work access routes during construction.

(viii) Location of waste accumulation areas, including areas for liquid, concrete, masonry, and asphalt.

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

(x) Location of outfalls.

(xi) Flow arrows that depict stormwater flow directions on-site and runoff direction.

(xii) Location of structural and non-structural control measures.

(xiii) Location of springs, streams, wetlands, and other State waters, including areas that require pre-existing vegetation be maintained within 50 horizontal feet of a receiving water, unless infeasible.

(xiv) Location of stream crossings located within the construction site boundary.

(7) Start a new site map before the current one becomes illegible. All site maps shall remain as part of the SWMP.

(8) Install control measures according to Standard Plans M-208-1, M-216-1, and M-615-1.

(9) Record in the SWMP, the approved Method Statement for Containing Pollutant Byproducts.

(10) Update the Potential Pollutants list in the SWMP and Spill Response Plan throughout construction.

2. Erosion Control Inspector (ECI).

The SWMP Administrator shall complete the duties of the ECI.

(1) ECI duties shall be as follows:

(i) Inspect initial placement and adherence to approved SWMP and SWMP site plan control measures

(ii) Assess the adequacy of control measures at the site to identify areas requiring new or modified control measures to minimize pollutant discharges.

(iii) Identify all areas of concern that may impact water quality and, if necessary, implement corrective actions.

(iv) Ensure all other agency Stormwater and inspection requirements are followed unless a waiver or other agreement has been made.

(2) The ECI shall immediately report to the Contractor and Engineer the following instances:

(i) Noncompliance which may endanger health or the environment, regardless of the cause of the incident.

(ii) Spills or discharges which exceeds any water quality standards.

(iii) Upset conditions which cause an exceedance of any water quality standards.

(3) Document spills, leaks, or overflows that result in the discharge of pollutants. The ECI shall record the time and date, weather conditions, reasons for spill, and how it was remediated.

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

1. SWMP. The Engineer will provide an approved SWMP design (includes items (1) through (4) as listed below) at the Pre-construction Conference, which is and shall remain the property of CDOT. The following Contract documents and reports shall be included or kept maintained, (as applicable), and updated in the SWMP under the appropriate items by the SWMP Administrator:

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

(2) SWMP Site Maps and Project Plan Title Sheet, if included in the original contract.

(3) Specifications – Standard and project special provisions related to stormwater and erosion control.

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

(5) Control measure Details not in Standard Plan M-208-1 – project specific non-standard details.

(6) All Water Quality Audit Reports and Form 105(s) relating to Water Quality, if applicable.

(7) Spill Response Plan – Reports of reportable spills submitted to CDPHE.

(8) List and Evaluation of Potential Pollutants – List of potential pollutants as described in Section 107 and approved Method Statement for Containing Pollutant Byproducts.

(9) Other Correspondence including agreements with other Municipal Separate Storm Sewer System (MS4s), approved deferral request, CDPHE audit documentation.

(10) TECS Certifications of the SWMP Administrator, kept current through the life of the project.

(11) Pre-construction Conference – Conference agenda with a certification of understanding for maintaining water quality standards and SWMP. The certification shall be signed by all attendees. A certification shall also be signed by all attendees of meetings held for new subcontractors beginning work on the project that could adversely affect water quality after the Pre-construction Conference has been held, if applicable.

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

The Engineer will incorporate the documents and reports available at the time of award. The Contractor shall provide and insert all other documents and reports as they become available during construction.

2. Reference Materials. The following Reference materials shall be used:

(1) CDOT Erosion Control and Stormwater Quality Guide.

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

(e) *Weekly Meetings*: If applicable, the Contractor shall conduct a weekly meeting with the Engineer and subcontractors to discuss construction activities that could adversely affect water quality, including the following:

(1) Unresolved issues from observations.

(2) Requirements of the SWMP.

(3) Problems that may have arisen in implementing the site specific SWMP or maintaining control measures.

(4) Control measures that are to be installed, removed, modified, or maintained, and associated SWMP modifications.

(5) Planned activities that will affect stormwater in order to proactively phase control measures.

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208.04 Control Measures for Stormwater. The SWMP Administrator shall modify the SWMP to clearly describe and locate all control measures implemented at the site to control potential sediment discharges.

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

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

Concrete products wasted on the ground during construction including, but not limited to, excess concrete removed from forms, spills, slop, and all other unused concrete are potential pollutants that shall be removed from the site or contained at a pre-approved containment area that has been identified in the SWMP. The concrete shall be picked up and recycled in accordance with 6 CCR 1007-2 (CDPHE Regulations Pertaining to Solid Waste Sites and Facilities) at regular intervals, as needed, or as directed by the Engineer.

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

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

(c) *Work Outside the Right of Way*. Disturbed areas, including staging areas, which are outside CDOT ROW and outside easements acquired by CDOT for construction, are the responsibility of the Contractor.

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

(e) *Stabilization*. Once earthwork has started, the Contractor shall maintain erosion control measures until permanent stabilization of the area has been completed and accepted. Clearing, grubbing and slope stabilization measures shall be performed regularly to ensure final stabilization. Failure to properly maintain erosion control and stabilization methods, either through improper phasing or sequencing will require the Contractor to repair or replace sections of earthwork at the Contractor's

expense. The Contractor shall schedule and implement the following stabilization measures during the course of the project:

1. Temporary Stabilization. At the end of each day, the Contractor shall stabilize disturbed areas by surface roughening, vertical tracking, or a combination thereof. Disturbed areas are locations where actions have been taken to alter the existing vegetation or underlying soil of a site, such as clearing, grading, road bed preparation, soil compaction, and movement and stockpiling of sediment and materials. Designated topsoil distributed on the surface or in stockpiles shall not receive temporary stabilization. Other stabilization measures may be implemented, as approved.

2. Interim Stabilization. As soon as it is known with reasonable certainty that work will be temporarily halted for 14 days or more, sediment and material stockpiles and disturbed areas shall be stabilized using one or more of the specified following methods:

   (1) Application of 1.5 tons per acres of mechanically crimped certified weed free hay or straw in combination with an approved organic mulch tackifier.

   (2) Placement of bonded fiber matrix in accordance with Section 213.

   (3) Placement of mulching (hydraulic) wood cellulose fiber mulch with tackifier, in accordance with Section 213.

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

   (5) Topsoil stockpiles shall receive interim stabilization in accordance with Section 207, unless specified as a different material than the other disturbed areas on-site.

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

4. Permanent Stabilization. Permanent stabilization is defined as the covering of disturbed areas with topsoil, seeding, mulching with tackifier, soil retention coverings, and such non-erodible methods as riprap, road shouldering, etc., or a combination thereof as required by the Contract. Other permanent stabilization techniques may be proposed by the Contractor, in writing, and shall be used when approved in writing by the Engineer. All permanent stabilization requirements shown on the plans shall be completed within four working days of the placement of the topsoil in accordance with Section 207.

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

(f) *Maintenance*. Erosion and sediment control practices and other protective measures identified in the SWMP as control measures for stormwater pollution prevention shall be maintained in effective operating condition until final acceptance of the project. Control measures shall be continuously

maintained in accordance with good engineering, hydrologic, and pollution control practices, including removal of collected sediment when silt depth is 50 percent or more of the effective height of the erosion control device. When possible, the Contractor shall use equipment with an operator rather than labor alone to remove the sediment.

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

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

Approved new or replaced control measures will be measured and paid for in accordance with this section. Devices damaged due to the Contractor's negligence shall be replaced at the Contractor's expense.

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

Temporary control measures may be removed prior to final acceptance of the project, as determined by the Engineer. If removed, the area in which these control measures were constructed shall be returned to a condition similar to that which existed prior to its disturbance. Removed control measures shall become the property of the Contractor. Maintenance shall be notified of the locations of any control measures left in place.

If the Contractor fails to complete construction within the approved contract time, the Contractor shall continue erosion and sediment control operations at its expense until acceptance of the work.

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

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

Material from pavement saw cutting operations shall be cleaned from the roadway surface during operations using a vacuum. A control measure, such as a berm, shall be placed to contain slurry from joint flushing operations until the residue can be removed from the soil surface. Aggregate bags, erosion logs or other permeable control measures shall not be used. Residue shall not flow into driving lanes. It shall be removed and disposed of in accordance with Section 107. Material containment and removal will not be paid for separately, but shall be included in the work.

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

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

(b) *Erosion Bales*. The bales shall be anchored securely to the ground with wood stakes. Erosion Bales shall be entrenched 4 inches minimum into the soil, tightly abutted with no gaps, staked, and backfilled around the entire outside perimeter. Erosion Bales cannot be used for Check Dams.

(c) *Silt Fence*. Silt fence shall be installed in locations as per M standard plans 208-1 and as specified in the Contract.

(d) *Temporary Berms*. Berms shall be constructed to the dimensions as per M 208-1 standard plans and as shown in the Contract, and sufficiently compacted to prevent erosion or failure. If the berm erodes or fails, it shall be immediately repaired or replaced at the Contractor's expense. Berms must be at least 18 inches tall or high enough to prevent overtopping. Berms must have a minimum of 4 to 6-foot base. Gradient of all receiving area above berm must be less than 2:1, or flatter. Outlets of anticipated flow from captured water behind berms must be designed with additional control measures suitable to control concentrated flow. Maximum drainage area for each outlet must be limited to 2 acres.

(e) *Temporary Diversion*. Diversions shall be constructed to the dimensions as per M standard plans 208-1 and as shown in the Contract and graded to drain to a designated outlet. The berm shall be sufficiently compacted to prevent erosion or failure. If the diversion erodes or fails, it shall be immediately repaired or replaced at the Contractor's expense.

(f) *Temporary Slope Drains*. Temporary slope drains shall be installed prior to installation of permanent facilities or growth of adequate ground cover on the slopes. All temporary slope drains shall be securely anchored to the slope. The inlets and outlets of temporary slope drains shall be protected to prevent erosion. Ensure drainage area for every slope drain is smaller than 5 acres. Ensure pipe or channel is properly sized, and for drainage areas larger than 1 acre the pipe size must be designed by an Engineer to ensure the drainage structure can accommodate the runoff resulting from a 2-year, 24-hour storm event. The use of prefabricated flared inlet sections is recommended.

(g) *Silt Berm*. Prior to installation of silt berms, the Contractor shall prepare the surface of the areas in which the berms are to be installed such that are they free of materials greater than 2 inches in diameter and are suitably smooth for the installation of the silt berms, as approved. See M standard 208-1 for details. Silt berms shall be secured with spikes. The Contractor shall install the silt berm in a manner that will prevent water from going around or under the silt berm. Silt berms shall be installed on top of soil retention blanket or turf reinforcement blanket.

(h) *Rock Check Dam*. Rock shall be installed at locations shown on the plans. Rock check dams shall conform to the dimensions shown on the plans. The Geotextile Erosion Control shall be Class 2 and conform to the requirements of Section 712, and shall extend up ⅔ of the riprap height with 6inch minimum cover over geotextile. Rock Check Dam shall be installed within a ditch sub excavated 6 inches below the flow line. The ends of the rip rap check dam shall be a minimum of 6 inches higher than the center of the check dam. Stone shall meet the requirements of Section 506. Larger rocks with larger void spaces should be used on top. See M standard 208-1 for details.

(i) *Riprap Outlet Protection*. Geotextile used shall be protected from cutting or tearing. Overlaps between two pieces of geotextile shall be 1-foot minimum. Riprap size shall be in accordance with Section 506 and as shown on the plans.

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

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

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

(k) *Sediment Trap*. Sediment traps shall be installed to collect sediment laden water and to minimize the potential of pollutants leaving the project site. Locations shall be in accordance with M standard 208-1 and as shown on the plans or as directed.

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

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

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

Sediment shall be removed from the trap when it has accumulated to one half of the wet storage depth of the trap and shall be disposed of in accordance with Section 208.

(l) *Erosion Logs*. Erosion logs shall be embedded 2 inches into the soil. Stakes shall be embedded so that the top of the stake does not extend past the top erosion log more than 2 inches, at the discretion of the Engineer, a shallower stake depth may be permitted if adverse site conditions are encountered, e.g. rock or frozen ground.

The Contractor shall maintain the erosion logs during construction to prevent sediment from passing over or under the logs. See M standard 208-1 for details.

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

(n) *Concrete Washout Structure*. The concrete washout structure shall meet or exceed the dimensions shown on the plans. Work on this structure shall not begin until written acceptance of location is provided by the Engineer. See M standard 208-1 for details.

Control measures designed for concrete washout waste shall be implemented. If the bottom of the excavated structure is within 5 feet of anticipated high ground water elevation or the soil does not

have adequate buffering capacity to meet water quality standards, an impermeable synthetic liner shall be installed with the minimum properties shown in Table 208-5 or use a prefabricated washout.

The following requirements shall be met:

(1) The structure shall contain all washout water.

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

(3) The site shall be located a minimum of 50 horizontal feet away from State waters and shall meet all requirements for containment and disposal as defined in Section 107.

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

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

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

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

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

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

(10) The structure shall be fenced with orange plastic construction fencing conforming to Section 607, to provide a barrier to construction equipment and to aid in identification of the concrete washout area.

(11) Concrete waste, liquid and solid, shall not exceed ⅔ the storage capacity of the washout structure.

(12) A concrete washout sign shall have letters at least 3 inches high and conform to Section 630.

(o) *Pre-fabricated concrete washout structures (Type 1 and Type 2).* Structures and sites shall meet the following requirements:

(1) Structure shall contain all washout water. If bins are determined to be leaking, the Contractor shall replace the bin on-site and clean up the spilled material and dispose of it properly.

(2) Structure shall be located a minimum of 50 horizontal feet away from State waters, and shall be confined so that no potential pollutants will enter State waters and other sensitive areas as defined in the Contract. Locations shall be as approved by the Engineer. The pre-fabricated structure shall be signed as “Concrete Washout”. Sign can be on portable bin.

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

(4) Washout bins shall be covered with a tarp tied down to the structure or staked to the ground when a storm event is anticipated.

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

(6) Concrete waste, liquid and solid, shall not exceed ⅔ the storage capacity of the washout structure.

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

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

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

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

Delivery to the site shall not occur until written acceptance is provided by the Engineer for both the product and the concrete waste disposal facility.

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

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

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

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

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

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

(r) *Aggregate Bag*. Aggregate bags shall be placed on a stable surface, consisting of hardscape or compacted gravel. If approved by the Engineer, the aggregate bag may be placed on compacted dirt areas, where bags conform to the surface and can effectively minimize sediment transport. Aggregate bags can be used on frozen ground when other control measures cannot be trenched or staked, but only until the ground is capable of being trenched and staked. Aggregate bags shall not be placed in concentrated flow areas, other than gutter pans. Aggregate bags shall be placed to conform to the surface without gaps to ensure that discharge water does not cause erosion. See M standard 208-1 for details.

(s) *Surface roughening*. Surface roughening creates horizontal grooves along the contour of the slope.

Roughening may be accomplished by furrowing, scarifying, ripping, or disking the soil surface to create a 2 to 4-inch minimum variation in soil surface.

(t) *Vertical Tracking*. Vertical tracking involves driving a tracked vehicle up and down the soil surface and creating horizontal grooves and ridges along the contour of the slope. Sandy soils or soils that are primarily rock need not be tracked.

208.06 Materials Handling and Spill Prevention. The SWMP Administrator shall clearly describe and record on the SWMP, all practices implemented at the site to minimize impacts from procedures or significant material that could contribute pollutants to runoff. Areas or procedures where potential spills can occur shall have a Spill Response Plan in place as specified in Section 107 or Section 208. Construction equipment, fuels, lubricants, and other petroleum distillates shall not be stored or stockpiled within 50 horizontal feet of any State waters or more if the Contractor determines necessary. Equipment fueling and servicing shall occur only within approved designated areas.

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

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

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

The Response Plan shall contain the following information:

(1) Identification and contact information of each Spill Response Coordinators.

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

(3) Location of cleanup kits.

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

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

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

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

(8) A summary of the employee training provided.

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

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

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

208.08 Limits of Disturbance. The Contractor shall limit construction activities to those areas within the limits of disturbance shown on the plans and cross-sections. Construction activities, in addition to the Contract work, shall include the on-site parking of vehicles or equipment, on-site staging, on-site batch plants, haul roads or work access, and all other activities which would disturb existing soil conditions. Staging areas within the LDA shall be as approved by the Engineer. Construction activities beyond the limits of disturbance due to Contractor negligence shall be restored to the original condition by the Contractor at the Contractor's expense. The SWMP Administrator shall tabulate additional disturbances not identified in the SWMP. If the disturbance at any time exceeds 1 acre (including as part of a common plan of development), the Contractor will need to apply for a Colorado Discharge Permit System-Stormwater Construction Permit (CDPS-SCP) and comply with all of CDOT's over one acre specifications.

The Contractor shall pursue stabilization of all disturbances to completion.

208.09 Regulatory Mechanism for Water Quality. Failure to implement the Stormwater Management Plan is a violation of the Colorado Water Quality Control Act. Penalties may be assessed to the Contractor by the appropriate agencies. All fines assessed to the Department for the Contractor's failure to implement the SWMP will be deducted from monies due the Contractor.

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

(1) Failure of the Contractor to implement necessary actions required by the Engineer as required by this section.

(2) Failure to construct or implement erosion control or spill containment measures required by the Contract, or failure to construct or implement them in accordance with the Contractor's schedule.

(3) Failure to stabilize disturbed areas as required by this section.

(4) Failure to replace or perform maintenance on an erosion control feature after notice from the Engineer to replace or perform maintenance as required by this section.

(5) Failure to remove and dispose of sediment from control measures as required.

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

(7) Failure to perform permanent stabilization as required by this section.

(8) Failure to prevent discharges not composed entirely of stormwater from leaving the construction site.

(9) Failure to provide the survey of Permanent Water Quality features when required on the project in accordance with this section.

The Engineer will immediately notify the Contractor of each incident of failure to perform erosion control in accordance with any water quality standards, specifications, including items (1) through (9) above by issuing a Form 105. Correction shall be made as soon as possible, immediately in most cases, but no later than 48 hours from the date of notification to correct the failure. The Contractor will be charged liquidated damages in the amount of $970 for each day after the 48-hour period has expired that one or more of the incidents of failure to perform the requirements for each Form 105 remains uncorrected. Liquidated damages will begin at Midnight of the date on which the 48 hours has expired.

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

If all other failures are not corrected within 48 hours after liquidated damages have begun to be assessed, the Engineer will issue a Stop Work Order in accordance with Section 105. Work shall not resume until the Engineer has approved a written corrective action plan submitted by the Contractor that includes measures to prevent future violations and a schedule for implementation.

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

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

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

Disagreements regarding the suggested corrective action for a control measure compliance issue between the Project Engineer, SWMP Administrator, and Superintendent, shall be discussed with the Resident Engineer and Region Water Pollution Control Manager. If after the discussions, the Project Engineer and the Contractor are still in disagreement and the Contractor believes that additional compensation is owed, the Contractor shall follow the decision of the Project Engineer, keep track of the costs and negotiate further with the Project Engineer. If after pursuing the issue, the Contractor is unable to reach an agreement with the Project Engineer, then the Contractor can follow the dispute process outlined in Section 105.

If the Contractor's corrective action plan and schedule are not submitted and approved within 96 hours of the initial notice, the Engineer will issue a Stop Work Order and have an on-site meeting with the Superintendent, SWMP Administrator, and the Superintendent's supervisor. This meeting will also be attended by the Resident Engineer, the Region Water Pollution Control Manager, and the Region Program Engineer. This meeting will identify and document needed corrective actions and a schedule for completion. If after the meeting, the unacceptable work is not remedied within the schedule as agreed to in the meeting, the Engineer will take action to effect compliance with the Contract and these specifications by utilizing CDOT Maintenance personnel or other non-Contractor forces and deduct the cost from any monies due or to become due to the Contractor pursuant to Section 105. Delays due to these Stop Work Orders shall be considered non- excusable. The Stop Work Order shall be in place until the project is in compliance.

If the Contractor remains non-responsive to requirements of the on-site meeting, the Engineer will start default or Contract termination procedures in accordance with Section 108. CDOT will proceed with corrective or disciplinary action in accordance with the Rules for Prequalification, Debarment, Bidding and Work on Transportation, Road, Highway and Bridge Public Projects.

When a failure meets any one of the following conditions, the Engineer will immediately issue a Stop Work Order in accordance with Section 105 irrespective of any other available remedy:

(1) It may endanger health or the environment.

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

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

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

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

(b) *Survey*. When Permanent Water Quality (PWQ) control measures are required on the project and once built, the Contractor shall survey the control measures to confirm that the PWQ control measures conform to the configuration, grade, and volume shown on the plans. The survey shall conform to Section 625. The results of the survey shall be submitted in accordance with CDOT's Survey Manual (AutoCAD to GIS and TMOSS Codes), or GIS with attribute tables, showing both designed and final elevations and configurations. Paper versions of the drawings shall be submitted with the stamp and seal of the Contractor's Surveyor.

PWQ control measures that do not meet the Contract requirements will be identified in writing by the Engineer, and shall be repaired or replaced at the Contractor's expense. Correction surveys shall be

performed at the Contractor's expense to confirm the locations, dimensions, and volume certification (for water quality capture volume structures only) of each PWQ control measure. The Engineer, CDOT Hydraulics Engineer for the region, Headquarters Permanent Water Quality Manager, and Headquarters Maintenance staff will perform a walkthrough of the PWQ control measures to confirm conformance to material requirements, locations, and dimensions. Before the walkthrough, the Contractor shall provide the corrected survey to the Engineer, Regional, and Headquarters Permanent Water Quality Managers.

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

All punch list and walkthrough items shall be completed and approved by the Engineer and Maintenance.

METHOD OF MEASUREMENT

208.11 Erosion Control Management on projects having less than one acre of total disturbed area will not be measured and paid for separately but shall be included in the work, unless otherwise specified in the contract (bid schedule). If contracted, ECM work will be measured as the actual number of days of ECM work performed, regardless of the number of personnel required for SWMP Administration and Erosion Control Inspection, including erosion control inspections, documentation, meeting participation, SWMP Administration, and the preparation of the SWMP. If the combined hours of SWMP Administration and Erosion Control Inspection is four hours or less in a day, the work will be measured as ½ day. If the combined hours of SWMP Administration and Erosion Control Inspection is more than four hours in a day, the work will be measured as one day. Total combined hours of ECM work exceeding eight hours in a day will still be paid as one day.

Erosion bales and rock check dams will be measured by the actual number installed and accepted.

Silt fence, silt berms, erosion logs, aggregate bags, silt dikes, temporary berms, temporary diversions, and temporary slope drains, will be measured by the actual number of linear feet that are installed and accepted. Measured length will not include required overlap.

Concrete washout structure will be measured by the actual number of structures that are installed and accepted.

Pre-fabricated concrete washout structures will be measured by the actual number of structures delivered to the site. It shall not include structures moved on-site.

Storm drain inlet protection will be measured by linear foot or actual number of devices that are installed and accepted.

Sediment trap quantities will be measured by the actual number installed and accepted.

Removal of trash that is not generated by construction activities will be measured by the actual number of hours that Contractor workers actively remove trash from the project. Each week the Contractor shall submit to the Engineer a list of workers and the hours spent collecting such trash.

Removal of accumulated sediment from traps, basins, areas adjacent to silt fences and erosion bales,

and other clean out excavation of accumulated sediment, and the disposal of such sediment, will be measured by the number of hours that equipment, labor, or both are used for sediment removal.

Vehicle tracking pads will be measured by the actual number constructed and accepted.

Additional aggregate required for maintaining vehicle tracking pads will be measured as the actual number of cubic yards installed and accepted.

Pre-fabricated vehicle tracking pads will be measured by the actual number of pads delivered to the site and set up to the minimum dimensions. It shall not include pads moved on-site.

BASIS OF PAYMENT

208.12 Control measures will be paid for at the Contract unit price for each of the items listed below that appear in the contract. Erosion Control management (ECM) duties on projects having less than one acre of total disturbed area will not be measured and paid for separately but shall be included in the work, unless otherwise specified in the contract.

Payment will be made under:

Pay Item	Pay Unit
Aggregate Bag	Linear Foot
Concrete Washout Structure	Each
Erosion Bales (Weed Free)	Each
Erosion Control Management	Day (If in the contract)
Erosion Log (Type 1) (_____ Inch)	Linear Foot
Erosion Log (Type 2) (_____Inch)	Linear Foot
Erosion Log (Type 3) (_____Inch)	Linear Foot
Pre-Fabricated Concrete Washout Structure (Type 1)	Each
Pre-Fabricated Concrete Washout Structure (Type 2)	Each
Pre-Fabricated Vehicle Tracking Pad	Each
Maintenance Aggregate (Vehicle Tracking Pad)	Cubic Yard
Removal and Disposal of Sediment (Equipment)	Hour
Removal and Disposal of Sediment (Labor)	Hour
Removal of Trash	Hour
Rock Check Dam	Each
Sediment Basin	Each
Sediment Trap	Each
Silt Berm	Linear Foot
Silt Dike	Linear Foot
Silt Fence	Linear Foot
Silt Fence (Reinforced)	Linear Foot
Storm Drain Inlet Protection (Type__)	Linear Foot

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Storm Drain Inlet Protection (Type__)	Each
Sweeping (Sediment Removal)	Hour
Temporary Berm	Linear Foot
Temporary Diversion	Linear Foot
Temporary Slope Drain	Linear Foot
Vehicle Tracking Pad	Each

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

Surface roughening and vertical tracking (temporary stabilization) will not be measured and paid for separately but shall be included in the work. Payment for each control measure item will be full compensation for all work and materials required to furnish, install, maintain, and remove the control measure when directed.

Payment for Removal and Disposal of Sediment (Equipment) will be full compensation for use of the equipment, including the operator. Payment for Removal and Disposal of Sediment (Labor) will be full compensation for use of the labor.

Payment for concrete washout structure, whether constructed or prefabricated, will be full compensation for all work and materials required to install, maintain, and remove the item. Maintenance and relocation, as required, of these structures throughout the duration of the project will not be measured and paid for separately, but shall be included in the work.

Silt berm spikes and wood spikes will not be measured and paid for separately, but shall be included in the work. When required, soil retention blankets will be measured and paid for in accordance with Section 216.

Compost and wood stakes for Erosion Log (Type 2) will not be measured and paid for separately, but shall be included in the work.

Spray-on mulch blankets required by the Contract, including those used in both interim and final stabilization, will be measured and paid for in accordance with Section 213.

Payment for storm drain inlet protection will be full compensation for all work, materials, and equipment required to complete the item, including surface preparation, maintenance throughout the project, and removal upon completion of the work. Aggregate will not be measured and paid for separately, but shall be included in the work.

Sweeping, when used as a control measure as shown in the Contract, will be measured by the number of hours that a pickup broom or equipment capable of collecting sediment, authorized by the Engineer, is used to remove sediment from the roadway or other paved surfaces. Each week the Contractor shall submit to the Engineer a statement detailing the type of sweeping equipment used and the number of hours it was used to pick up sediment. The operator will not be measured and paid for separately, but shall be included in the work.

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

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Payment for vehicle tracking pad will be full compensation for all work, materials and equipment required to construct, maintain, and remove the entrance upon completion of the work. Aggregate and geotextile will not be measured and paid for separately, but shall be included in the work. If additional aggregate for maintenance of vehicle tracking pads is required, it will be measured by the cubic yard in accordance with Section 304 and will be paid for under this Section as Maintenance Aggregate (Vehicle Tracking Pad).

Seeding, sod, mulching, soil retention blanket, and riprap will be measured and paid for in accordance with Sections 212, 213, 216, and 506.

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

Payment will be made for control measures replaced as approved by the Engineer. Temporary erosion and sediment control measures required due to the Contractor’s negligence, carelessness, or failure to install permanent controls as a part of the work as scheduled or ordered by the Engineer or for the Contractor's convenience, shall be performed at the Contractor’s expense. If the Contractor fails to complete construction within the contract time, payment will not be made for Section 208 pay items for the period of time after expiration of the contract time. These items shall be provided at the Contractor's expense.

October 1, 2021

REVISION OF SECTION 212
SOIL AMENDMENTS, SEEDING, AND SODDING

NOTICE

This is a standard special provision that revises or modifies CDOT's *Standard Specifications for Road and Bridge Construction.* It has gone through a formal review and approval process and has been issued by CDOT's Project Development Branch with formal instructions for its use on CDOT construction projects. It is to be used as written without change. Do not use modified versions of this special provision on CDOT construction projects, and do not use this special provision on CDOT projects in a manner other than that specified in the instructions unless such use is first approved by CDOT's Standards and Specifications Unit. The instructions for use on CDOT construction projects appear below.

Other agencies which use the *Standard Specifications for Road and Bridge Construction* to administer construction projects may use this special provision as appropriate and at their own risk.

Instructions for use on CDOT construction projects:

Use in projects having earthwork disturbances that will be stabilized with vegetation.

REVISION OF SECTION 212
SOIL AMENDMENTS, SEEDING, AND SODDING

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.

October 1, 2021

REVISION OF SECTION 214
NURSERY STOCK CONTAINERS AND UNROOTED CUTTINGS

NOTICE

This is a standard special provision that revises or modifies CDOT's *Standard Specifications for Road and Bridge Construction.* It has gone through a formal review and approval process and has been issued by CDOT's Project Development Branch with formal instructions for its use on CDOT construction projects. It is to be used as written without change. Do not use modified versions of this special provision on CDOT construction projects, and do not use this special provision on CDOT projects in a manner other than that specified in the instructions unless such use is first approved by CDOT's Standards and Specifications Unit. The instructions for use on CDOT construction projects appear below.

Other agencies which use the *Standard Specifications for Road and Bridge Construction* to administer construction projects may use this special provision as appropriate and at their own risk.

Instructions for use on CDOT construction projects:

Use in projects furnishing and installing herbaceous and woody plant materials also known as "nursery stock".

REVISION OF SECTION 214
NURSERY STOCK CONTAINERS AND UNROOTED CUTTINGS

Delete and replace Section 214 of the Standard Specifications with the following:

DESCRIPTION

214.01 This work consists of furnishing all plants, labor, materials and equipment to install herbaceous and woody plant material, hereinafter referred to as "nursery stock". The work may also consist of obtaining live "unrooted cuttings" from approved donor plants and installing them on the site as shown on the plans.

All approvals and direction required from the Engineer in this specification will involve the Engineer working directly with Region or Headquarters Environmental Staff, as identified in the Contract.

MATERIALS

214.02 Nursery Stock and unrooted cuttings shall be of the minimum sizes and species as designated on the plans, in healthy condition with normal well-developed branch and root systems, and shall conform to the requirements of the *American Standard for Nursery Stock* (ANSI Z60.1-2014). For specified deep rooted container stock the container class volume ranges shall be substituted with the requirements of this specification. See subsection 1.1.3.3 of the American Standard for Nursery Stock regarding unclassified containers.

All nursery stock and unrooted cuttings shall be free from plant diseases and insect pests. All shipments of plants shall comply with all nursery inspection and plant quarantine regulations of the State of origin and destination, and the Federal regulations governing Interstate movement of nursery stock. The Contractor shall submit proof of deposit that nursery stock, Contract species and Contract quantity have been secured 30 days post Environmental Pre-Construction Conference. For multi-year projects (two or more continuous years) the contractor shall submit a schedule for approval documenting when proof of deposits on nursery stock will be provided.

The minimum acceptable sizes of all nursery stock, with branches in normal position, shall conform to the measurements specified in the Landscape/Mitigation Plans.

Hardiness zones are defined in U.S. Department of Agriculture (USDA) 2012 Plant Hardiness Zone Map publications. Only Nursery Stock rated for USDA Hardiness Zones 2, 3, 4, and 5 will be accepted.

Other than approved unrooted cuttings or as otherwise approved by the Engineer, plants shall be nursery grown for at least one growing season, or plants that have established themselves in accordance with definitions set forth in the Colorado Nursery Act, Title 35, Article 26, CRS.

Field collected trees and shrubs shall have been root-pruned during their growing period in the nursery in accordance with standard nursery practice outlined in the American Standard for Nursery Stock.

No species substitutions are permitted without written approval. If nursery stock of acceptable quality and specified variety or size are not available, before any species substitutions will be approved the Contractor shall supply to the Engineer three written letters from nurseries verifying that a species or plant size is not available. Once three letters are provided, the Contractor Shall with Engineer's written approval:

(1) Substitute acceptable nursery stock that are larger than specified at no change in Contract price. For deep rooted nursery stock, the minimum depth requirement of the container must be maintained as stated in this specification.
(2) Substitute smaller plants than those specified on the Landscape/Mitigation Plans at the adjusted price or ratio stated in the written approval.
(3) Substitute of plants of different genus, species or variety shall be submitted to the Engineer for approval 30 days prior to installation at the adjusted price stated in the written request.

REVISION OF SECTION 214
NURSERY STOCK CONTAINERS AND UNROOTED CUTTINGS

At the Environmental Pre-construction Conference, the Contractor shall name the nursery stock supplier for all items. Nursery stock will be rejected for not meeting the Contract at any of the four following times and locations:

(1) At the nursery stock supplier's location during inspection. The Engineer will notify the contractor when the nursery stock will be inspected.
(2) On the project site at the time of delivery, prior to planting.
(3) At the time of installation.
(4) At the partial or final acceptance walkthroughs on the project site.

Plant materials supplied by the Contractor shall be inspected by the Engineer at the growing site and tagged or otherwise approved for delivery. Inspection at nursery does not preclude right of rejection at construction site. Contractor shall remove rejected materials immediately from the site at Contractors expense. The Contractor shall ensure that all nursery materials meet the requirements of this Section prior to delivery.

Proposed materials shall be flagged at the nurseries by the Contractor prior to viewing by the Engineer. The Contractor shall schedule with the Engineer a time for viewing plant material at the nursery. Trips to nurseries shall be efficiently arranged to allow Engineer to maximize their viewing time. A minimum of two weeks shall be allowed for this viewing prior to time that plants are to be dug. When requested by the Engineer photographs of plant material or representative samples of plants shall be submitted. Viewing of plant materials by the Engineer at the nursery does not preclude their right to reject material at the site of planting.

The Contractor shall notify the Engineer at least three working days in advance of the anticipated delivery date of any plant material. The Contractor shall submit an invoice for each shipment of plants showing the quantities, kinds, and sizes of materials along with the certificate of inspection. Evidence of inadequate protection of plant material following digging, transit, storage or other handling will be cause for rejection. Upon arrival at the temporary storage location or work site, plants shall be inspected for proper handling (including but not limited to shipping procedures) in the presence of the Engineer for damage, including but not limited to dried out roots, broken branches, broken or loosened root balls, or torn bark. The Contractor shall replace the damaged material at their own expense.

Container grown nursery stock shall have a well-established root system reaching the sides and bottom of the container to provide a firm mass of growing medium, but shall not be root bound (i.e. have excessive root growth encircling the inside of the container). Bare root material will not be accepted as a substitution for nursery stock specified as container or balled and burlapped specified nursery stock.

Each species shall be identified by means of grower's label affixed to the plant. The grower's label shall include the data necessary to indicate conformance to specifications. For minimum plant requirements of height, width, minimum multi stems and root ball diameter as appropriate for the specified species type see the Plant Schedule on the Plans.

(a) *Nursery stock.* Contractor shall file copies of certificates after acceptance of material. Evidence of inadequate protection following digging, carelessness while in transit, or improper handling or storage, will be cause for rejection. When a plant has been rejected, the Contractor shall remove it from the area of the work and replace it with one of the required size and quality conforming to one of the following:

(1) Deep Rooted Containers (DRC) shall be containers for growing native plants that are narrower in diameter and longer than standard nursery pots of equal volume. Containers must have physical "anti-spiraling" features such as vertical ribs on the inside walls or side slits in the sidewalls that will air-prune roots. Containers that have been treated with compounds such a copper to chemically prune the roots will not be accepted. Deep rooted container classifications shall have the following properties:

Deep Rooted Container Class Specification	Minimum Height (Inches)	Minimum Volume (Cubic Inches)
DRC #10	8	10
DRC #40	9	40
DRC #60	13	60
DRC #180	14	180
DRC #300	29	300

(2) Standard Nursery Practice Containers (SNC) shall conform to the recommended specification in the *American Standard for Nursery* Stock (ANSI Z60.1-2014). For minimum plant requirements of height or width as appropriate for the specified species type see the Plant List on the drawings. SNC classifications shall have the following properties:

Standard Container Class Specification	Acceptable Volume Range (Cubic Inches)
#1	152-251
#5	785-1242
#10	2080-2646
#20	4520-5152

(3) Balled and burlapped or large container shall conform to the recommended specifications in the *American Standard for Nursery Stock* (ANSI Z60.1-2014). Single stem deciduous tree caliper measurements shall be taken six inches above the ground for field grown stock and from soil line for container grown stock. Multi-stem deciduous tree and evergreen tree height measurement shall be from ground level for field grown and from soil line for container grown stock.

(b) *Unrooted Cuttings.* Unless otherwise authorized, the Contractor shall notify the Engineer at least five working days in advance of the anticipated start of harvesting cuttings. All cuttings shall be harvested from approved parent material. Approval of parent material shall be in writing from the Engineer. This approval will include a detailed description of the approved locations. The Contractor shall select a site, and if outside of the construction boundary, provide written approval from the Owner, when applicable, for access and harvesting the required number of cuttings. The harvesting site shall be left clean and tidy, to the satisfaction of the Engineer and the Owner, when applicable. Unused material including trimmings shall be cut up to 2 feet in length and evenly distributed around the wetland mitigation site.

Unrooted cuttings shall be harvested and planted in early spring (March 1st to April 15th) while the plants are still dormant. However, the Engineer may authorize an alternative harvesting and planting timeframe based on project timing. Immediately upon harvesting, all cuttings shall be placed in water so that the cut ends are covered in water, and the cuttings shall be stored in a cool location. Plants shall be completely submerged in containers with water if not planted within 24 hours of harvesting. The containers shall be continuously shaded and protected from the wind. Cuttings shall be protected from drying at all times. During transportation, the cuttings shall be kept completely submerged in containers with water in orderly fashion to prevent damage and to facilitate handling. Cuttings should be bundled using natural twine or flexible staking tape (and not with wire) in uniform groups of 25-100 to allow for easy tracking of quantities.

(1) *Live Willow Stakes* –Shall be unrooted cuttings approximately 3 feet long and between ½ and 1-inch in diameter. All side branches must be trimmed. Willow cuttings shall be cut from branches with smooth undamaged bark. Branches with thick, cracked bark shall not be used because they will not

re-sprout effectively. Cuttings shall be cut about one foot from the ground using sharp loppers or pruning tools. Cuts shall be clean, without stripping the bark or splitting the wood. The base cuts shall be at a 45-degree angle to identify the root end of the cutting. The top shall be cut off with a square cut so that the top of the stake is easily distinguishable from the bottom. If willow stakes are to be planted in the second half of the growing season (June 15th to October 15th), then the cut top end shall be dipped into latex paint (covering approximately 1 inch at the top of the stake) to seal and reduce desiccation in hot/dry establishment conditions.

(2) *Live Brush Mattress*– Live willow unrooted cuttings to be used in brush mattress as a bioengineering application. The primary branch shall be approximately 6 – 15 feet long and between ½ and 2 inches in diameter at the base. Side branches are not trimmed unless a side branch is large enough to be used as a primary branch itself. Brush cuttings shall be cut at a height of between six to twelve inches above the ground. Cuts shall be clean, without stripping the bark or splitting the wood. Live brush cuttings should be composed primarily of willow cuttings, but may include up to 20% cottonwood branch cuttings

(3) *Live Brush Fascines* - Live willow unrooted cuttings to be used in fascines as a bioengineering application. Unrooted cuttings diameter shall vary and shall be a minimum 5 feet long and between ¼ and 2 inches in diameter. Up to 30 percent of the bundle may be plant material that does not root easily or dead plant material. The remaining 70 percent of the bundle shall consist of younger wood between 1 to 4 years old (at a minimum 25 willow cuttings per fascines). Fascines bundles may be stored submersed in water for no longer than two weeks, if necessary.

(c) *Wood Stakes.* Wood stakes for deciduous tree support shall be 2 inches' x 2 inches square, or 2 ½ inch diameter and 6 feet long free from bends. One end of all wood posts shall be pointed. Metal stakes for deciduous tree support shall be studded 6 feet long T-Post with a minimum weight of 1.25 lbs. per linear foot. Metal stakes for evergreen tree support shall be 24 inches long and consist of either minimum weight 1.25 lbs. per linear feet T-Post or #4 or larger rebar. Wood stakes shall be made of untreated wood guaranteed to last in the ground at least two growing seasons.

(d) *Backfill*. Backfill material consists of topsoil in accordance with the Contract requirements of 207 and additional compost material thoroughly mixed together and reasonably free of rocks and plant material. All other foreign material shall be removed. Do not use subsoil removed from planting pits as backfill unless accepted by CDOT Project Engineer. Compost shall be mixed into the backfill material at a rate of 25 percent by volume.

Live Willow Stake applications do not require additional compost in the backfill material, but holes must be backfilled with topsoil or native fine alluvium (sand or gravel).

Compost for planting pits shall be in accordance with section 212.

(e) *Wood Mulch*. Mulch shall consist of virgin moist wood product with shavings having approximate dimensions of: Width: ¼ to ½ inch, Length 3 to 4 inches. Mulch shall be free of material injurious to plant growth. Sources of mulch should be free of weeds and invasive plant parts or seeds. Sawdust, dirt, garbage, or other debris mixed in the mulch is not acceptable. Contractor shall submit one pound of proposed mulch for approval.

(f) *Flex Pipe Bark Protector*. Bark Protector shall be made of flexible UV stabilized plastic that shall be able to push off and separate with tree growth, without harming the bark, stem, wood or any part of the tree.

(g) *Wildlife Protection Fencing*. When specified on plans fencing shall be made of 20-gage steel with black-

vinyl coating, with a maximum opening of 1 inch.

(h) *Deciduous Tree Wrapping Materials*. Wrapping material shall be horticulturally standard waterproof corrugated cardboard material that allows stretching over time to prevent girdling of the tree.

(i) *Tree Straps.* Breathable nylon webbing 18 inches long and 1 ½ inches wide with metal grommets at each end.

CONSTRUCTION REQUIREMENTS

214.03 All nursery stock shall be protected from drying out or other injury with acceptable practices within the industry. Broken and damaged roots shall be pruned before planting.

(a) *Planting Seasons.* Nursery stock shall be planted in accordance with the Contract.

Areas to be planted shall be brought to the lines and grades designated or approved. The Contractor shall place all plant material according to the approved Landscape/Mitigation Plans to the degree that unsuitable planting locations shall be avoided. Trees shall be planted outside of the clear zone, except when guardrail or vertical curb exists, this distance may be reduced to 20 feet. Shrubs shall not be planted closer than 6 feet from the edge of pavement. Locations of all nursery stock and unrooted cuttings shall be staked in the field prior to planting. Plants and planting locations shall be checked in the field by CDOT Region Biologist or CDOT Landscape Architect and shall be adjusted to the position as approved before planting begins. Planting holes shall not be constructed until written approval has been received from the Engineer.

(b) *Excavation.* Planting pits shall be circular in outline with vertical or sloped sides. The Contractor shall roughen sides of the pit to remove any compacting or glazing. When conditions detrimental to plant growth are encountered, such as over compacted topsoil, rubble fill, debris, or obstructions, notify the Engineer before planting. Use of a tree spade to dig plant pits is prohibited.

(c) *Planting.* Planting shall be done in accordance with good horticultural practices and only after topsoil has been placed. Plants of upright growth shall be set plumb and plants of prostrate type shall be set normal to the ground surface. Plants with dry, broken, or crumbling roots will not be accepted for planting. When conditions detrimental to plant growth are encountered, such as over compacted topsoil, rubble fill, debris, or obstructions, notify the Engineer before planting. Use of a tree spade to dig plant pits is prohibited. Pits excavated with a backhoe shall be scarified as needed.

For automated irrigated areas planting pits shall be dug 2 to 4 inches shallower than the height of the rootball for trees, and 2 inches shallower for shrubs. In non-irrigated areas, planting pits shall be dug so that the top of the rootball is 2-4 inches depressed from surrounding final grades. The nursery stock shall be set in the center of the planting pit on undisturbed soil.
Trees shall be stabilized and then the top third of the wire basket, any twine and burlap shall be removed before the pit is backfilled. Shrubs shall be planted in the center of the pit. All of the plastic, metal and fabric, containers shall be removed. Peat containers shall be removed if directed by the Engineer. If the nursery stock is root-bound (roots circle the root ball) shallow scores with a sharp knife ¼ to ½ inch deep shall be made along the edges and the bottom of the rootball.

Areas to be planted with ground cover shall be prepared by placing topsoil and a ½ inch layer of soil conditioner on the ground surface, and rototilling to a depth of 6 inches. Ground cover shall be planted by excavating to a depth sufficient to accommodate the root structure of plant materials without crimping or bending roots. After planting, backfill shall be placed around the ground cover and compacted firmly

around the roots. The planted areas shall be brought to a smooth and uniform grade, and then top dressed with a 2-inch-deep wood mulch.

(d) *Backfilling.* Backfill shall be thoroughly worked and watered-in to eliminate air pockets. For trees backfill ½ of the planting pit and saturate to remove air pockets. After settling finish backfilling and saturate again. After the soil has settled, nursery stock must be in the proper position and at the proper depth. Saucers shall be prepared around each plant to the dimensions shown on the planting details. For all nursery stock the excavated area shall be covered with a 4-inch-thick layer of wood mulch. After completion of all planting and before acceptance of the work, the Contractor shall water nursery stock installed under this Contract, as needed to maintain a moist root zone optimum for plant growth. Nursery stock or prepared surfaces damaged during planting operations by the Contractor's operations shall be replaced at the Contractor's expense.

Surplus soil remaining after backfilling is completed shall be used for constructing water retention berms, or, if not needed for berms, shall be thinly distributed (wasted) in the vicinity, subject to approval of the Engineer.

(e) *Wood Mulch*. Mulch shall be placed to a minimum of 4-inch depth to cover nursery stock excavated areas, but not touching the trunk of trees.

(f) *Pruning.* All deciduous trees and shrubs shall be pruned in accordance with standard horticultural practice, preserving the natural character of the plant. Guidelines for pruning are indicated in the planting details. Pruning cuts shall be made with sharp clean tools.

All clippings shall become the property of the Contractor and be removed from the site.

(g) *Guying.* All deciduous trees 2-inch caliper and greater shall be staked as designated on the plans. Coniferous trees 4 feet or taller shall be staked as designated on the plans.

(h) *Deciduous Wrapping Materials.* Wrapping shall be applied from the base of the tree upward to the second scaffold branch and secured with arbor tape. Populus species shall be exempt from tree wrap. The Contractor shall submit the manufacturer's certification for the wrapping material requirements. Wrapping shall be done in the fall months prior to freeze, and removed in the spring. Wrapping shall not remain on any trees throughout the summer months. Wrapping shall be removed by the Contractor.

All plant tags shall be removed from plants and all packing or other material used by the Contractor shall be removed from the site. Upon completion of work, the Contractor shall remove plant containers, bags and other debris and leave area in clean, acceptable condition.

(i) *Unrooted Cuttings.* Upon arrival at the construction site, cuttings shall be inspected for acceptability. Only healthy, undamaged material will be accepted. During installation activities, the cuttings shall be kept wet and out of the direct sun light. No cuttings shall be out of water for more than 10 minutes before planting. Water shall be applied to areas around the cuttings until the soil mass is saturated. Cuttings shall be watered thoroughly every day for a period of one month, unless natural soil saturation occurs within 12 inches of soil surface, as verified by the Engineer. Unrooted cuttings shall be used in the following:

1. *Live Willow Stakes*. Using a rock bar or other mechanical method such as a stinger backhoe attachment or trenching equipment, create a vertical hole or trench deep enough to reach a depth at which the water table will be present throughout the growing season, or deep enough to extend below the low summer flow, or groundwater elevation of the adjacent stream channel. Planting zones shall be surveyed and staked in the field for approval by the Engineer prior to planting. Insert 2/3 of the live cutting into the hole/trench, with the 45 degree cut end down, so that the end of the cutting maintains contact with the

natural water table throughout the entire growing season; planting depth must consider the natural fall of the water table that typically occurs in late summer. Planting depth shall be verified by Engineer. The placement of these cuttings shall be in areas shown on the plans and at the spacing specified. Minor adjustments in placement and spacing may be necessary based on field conditions.
The root end of cuttings shall be tamped into the pilot hole or placed in a trench to a minimum depth of 2 feet, or until the root-end of the cutting meets elevation at which groundwater will be present at the driest point of the growing season. Note that some water tables will vary greatly from April to October; the Contractor shall consult with the Engineer and Region environmental staff for proper depth.

The top of the cutting shall protrude a minimum of 4 inches, but no more than 1/3 of its length with at least two live buds showing above ground. Dead blow hammers or rubber mallets shall be used to tamp in the cuttings into holes, in such manner as to not cause the wood to split. Trench planting should not require any tamping.

Live cuttings require direct contact with soil. Soil shall be placed/backfilled in any spaces around the cuttings and tamped into place to remove any air pockets; if necessary, a soil-water slurry should be used to ensure good soil contact with cutting.

Water shall be applied to the planted cutting stakes areas until the soil mass is saturated. Cuttings shall be watered thoroughly every day for a period of one month, unless natural soil saturation occurs within 12 inches of soil surface, as determined by the Engineer, in consultation with the Region environmental representative.

2. *Live Brush Mattress.* Live unrooted cuttings shall be evenly distributed in the dimensions shown on the plans and laid flat against sloped stream bank to create a continuous mat of brush. The cut-end of the *branches* shall be buried in the toe of the slope. At a minimum, the ends shall be buried 6 inches at the toe of slope or otherwise secured with willow fascines, log and/or rock as specified in plans. The Contractor shall ensure that the lower willow tips are in contact with soil that is saturated during normal low flow stream conditions. The mattress will be secured to the stream embankment with a network of wood stakes and twine. Utilize minimum length 24-inch-long wood stakes and 0.25-inch diameter machine spun bristle coil twine (tensile strength: 140 pounds).

The Contractor shall cover the mattress with a thin layer of clean topsoil and seed with wetland seed mix. Soil covering should cover 90 percent of the unrooted cuttings. Approximately 10 percent but no more than 20 percent of the cuttings should daylight above the soil covering once soil has settled into the voids of the mattress.

3. *Live Brush Fascine.* A fascine is a bundle of unrooted cuttings, fastened together with 0.25-inch diameter machine spun bristle coil twine (tensile strength: 140 lbs.) to keep the bundles tightly tied until placed in the ground and buried. Clean topsoil shall be worked over and around the bundles, no compaction is required. The length of the wattle bundle shall be placed parallel with the contour of the ground. Wood stakes shall be placed as shown on the plans centered along bundle. Utilize minimum length 24-inch wood stakes and 0.25-inch diameter machine spun bristle coil twine (tensile strength: 140 pounds). The Contractor shall puddle with water and allow soil to settle, then repeat backfill procedure until wattle bundle is covered to three-quarters of bundle height. Unrooted cuttings installed above reliable ground water supply shall be watered thoroughly every day for a period of one month. Watering shall be continued after the first month at a minimum of once a week until the completion of the project.

(j) *Watering.*

1. Watering for nursery stock in irrigated areas (projects with 623 pay items). Irrigation system shall be operating and supplying the correct amount of water to the immediate area prior to any nursery stock being planted. Plants shall be thoroughly watered within 15 minutes of planting.

2. Watering in newly planted nursery stock and unrooted cuttings in non-irrigated areas. The Contractor shall furnish and supply the correct amount of water to the area receiving unrooted cuttings and nursery stock to keep the plants in a healthy and vigorous condition. All plantings shall be watered within four hours of placement. All plant material shown on the plans (excluding seeded areas) shall be watered to ensure successful establishment of the plant. Rate of flow shall allow the water to soak into the soil adjacent to the planting. At no time shall watering operations be applied at a rate or intensity that causes surface run off.

(k) *Maintenance of landscape during construction*. Maintenance of landscaping shall start immediately upon placement of first permanent landscaping and continue until the Notice of Substantial Landscape Completion has been received. The Contractor shall maintain the seeded areas, nursery stock and unrooted cuttings in a healthy and vigorous growing condition to ensure successful establishment. Maintenance shall consist of the following:

Work Item	Function	Notes
Weed control of areas having native seed	Areas shall be kept free of harmful insects, disease and weeds	Weed management strategies shall be discussed during the Site Pre-Vegetation Conference.
Hand watering trees	All plant material shown on the plans (excluding seeded areas) shall be watered to ensure successful establishment of the tree. Rate of flow must allow the water to soak into the soil adjacent to the planting. At no time shall watering operations be applied at a rate or intensity that causes surface run off.	Trees shall be watered two times a month at a rate of 10 gallons for each diameter inch of the tree for the months of May through October, and one time per month for the months of November through April.
Hand watering trees, shrubs, herbaceous plants and unrooted cuttings	All plant material shown on the plans (excluding seeded areas) shall be watered to ensure successful establishment of the plant. Rate of flow must allow the water to soak into the soil adjacent to the planting. At no time shall watering operations be applied at a rate or intensity that causes surface run off.	All plant material shown on the plans (excluding seeded areas) shall be watered to ensure successful establishment of the plant. Rate of flow must allow the water to soak into the soil adjacent to the planting. At no time shall watering operations be applied at a rate or intensity that causes surface run off.

214.04 Nursery Stock Warranty Period. After all landscaping work in the Contract has been installed and completed, a Substantial Landscape Completion Inspection shall be held including the Contractor, Engineer and

the Region Environmental Staff to determine acceptability of the landscaping work. During the inspection, an inventory of rejected material will be made, and corrective and necessary cleanup measures will be determined. The approval of the Notice of Substantial Landscape Completion will take place upon successful removal of rejected material and required cleanup measures.

The beginning of the Nursery Stock Warranty Period depends upon the time the receipt from the Engineer of a written Notice of Substantial Landscape Completion is issued. If the Notice of Substantial Landscape Completion is issued between March 20 and June 21, the Nursery Strock Warranty Period begins immediately and lasts for a period of 12 months. If the Notice of Substantial Landscape Completion is issued prior to this time (January 1 through March 19), Nursery Stock Warranty begins on March 20 of that year and lasts for the remaining months until March 20 of the following year. If the Notice of Substantial Landscape Completion is issued after this time (June 22 through December 31), the Nursery Stock Warranty Period begins on March 20 of the following year and lasts for a period of 12 months. Variations to these dates are permitted, and shall be as directed.

Dead, dying, or rejected material shall be removed each month during the Nursery Stock Warranty Period as directed. DRC #10 and SNC #1 along with all larger nursery stock container sizer shall be replaced only one time during the spring calendar dates as shown above. Nursery stock containers smaller than DRC #10 and SNC #1 along with seeding and unrooted cuttings will not be included in Nursery Stock Warranty Period. Nursery Stock replacements shall be planted in accordance with the Contract and shall be subject to all requirements specified for the original material.

Contractor access to private property for nursery stock replacement work will not be extended beyond the terms of the temporary construction easement(s) for the project, unless another temporary easement agreement or extension of the original temporary easement is granted.

The contract performance and payment bond, as required in subsection 103.03, shall include all required work involved during the Nursery Stock Warranty Period.

METHOD OF MEASUREMENT

214.05 The quantity of nursery stock to be measured will be the number of plants, of the types and sizes designated in the Contract that are actually planted and accepted.

Live Willow Stakes will be measured by the number actually installed and accepted.

Live Brush Mattress will be measured by the actual number of linear feet installed and accepted.

Live Brush Fascines will be measured by the actual number of linear feet installed per the detail on the plans and accepted.

BASIS OF PAYMENT

214.06 The accepted quantities of nursery stock and unrooted cuttings will be paid for at the contract unit price for each of the items listed below:

Payment for the total cost of the item will be made at the completion of the installation of each item.

Cost of the performance bond shall be included in the cost of the plant items.
Payment will be made under:

Pay Item	**Pay Unit**
_____ Tree (____Inch Caliper)	Each

_____ Tree (____Foot)	Each
Nursery Stock Container (DRC #___)	Each
Nursery Stock Container (SNC#_____)	Each
Live Willow Stakes	Each
Live Willow Fascine	Linear Feet
Live Brush Mattress	Linear Feet

Nursery Stock Warranty Period will not be measured and paid for separately, but shall be included in the work. All costs associated with replacing nursery stock larger than DRC#10 and SNC #1 shall be at the Contractor's expense.

Additional slow-release organic fertilizer for nursery stock shall be used as specified in the plans will not be measured and paid for separately, but shall be included in the work.

Compost required for backfill of nursery stock will not be paid for separately, but shall be included in the work.

All water required for nursery stock and unrooted cuttings in projects without 623 pay items will be measured and paid for in accordance with Section 209 under Pay Item Water (Landscaping), up to the Notice of Substantial Completion.

Water required after the acceptance of the Notice of Substantial Completion will not be measured and paid for separately but shall be included in the work.

Standard waterproof tree wrap and flex pipe bark protector for nursery stock will not be measured and paid for separately, but shall be included in the work.

Cleaning or repair of site conditions from equipment used by the Contractor for planting operations will not be measured and paid for separately by shall be included in the work.
Wood mulch, stakes, guy wire, PVC protector, safety caps, wrapping, and all other materials required to install a tree will not be measured and paid for separately but shall be included in the work.

Wood stakes and other materials required to secure Live Brush Mattresses and Live Brush Fascines will not be measured and paid for separately but shall be included in the work.

Seeding will be measured and paid for in accordance with Section 212 and Topsoil will be measured and paid for in accordance with Section 207.

Maintenance of Landscaping during construction will not be measured and paid for separately but shall be included in the work.

October 1, 2021

REVISION OF SECTION 601
STRUCTURAL CONCRETE

NOTICE

This is a standard special provision that revises CDOT's *Standard Specifications for Road and Bridge Construction*. It has gone through a formal review and approval process and has been issued by CDOT's Construction Services Branch with formal instructions regarding its use. It is to be used as written without change. Do not use modified versions of this special provision nor use this special provision in a manner other than specified in the instructions unless such use is first approved by the Construction Services Branch. The instructions for use on CDOT construction projects appear below.

Other agencies that use the *Standard Specifications for Road and Bridge Construction* to administer construction projects may use this special provision as appropriate and at their own risk.

Instructions for use on CDOT construction projects:
Use this standard special provision on all projects.

REVISION OF SECTION 601
STRUCTURAL CONCRETE

Section 601 of the Standard Specifications is hereby revised for this project.

Delete Subsection 601.10 (c) 8. and replace it with the following:

8. The Contractor shall submit two sets of the fabricator's shop and erection drawings to the Engineer. The drawings shall be designed and electronically sealed by the Contractor's Engineer. The drawings will not be approved or returned to the Contractor. The drawings shall indicate the grade of steel, the physical and section properties of all permanent steel bridge deck form sheets, and attachment details.

Delete Subsection 601.11 (a) and replace it with the following:

(a) *General.* The Contractor shall be responsible for designing and constructing falsework. The Contractor's Engineer shall determine whether falsework is necessary. When the Contractor's Engineer determines falsework is unnecessary, the Contractor shall submit a written statement signed by the Contractor's Engineer so stating. The Contractor’s Engineer shall prepare and electronically seal all falsework drawings including revisions, which shall meet the requirements of subsection 601.11. The Contractor shall stamp the drawings “Approved for Construction” and submit to the Engineer. The Engineer will not approve the drawings.

October 1, 2021

REVISION OF SECTION 601
CONCRETE MIX DESIGNS

NOTICE

This is a project special provision that revises or modifies CDOT's *Standard Specifications for Road and Bridge Construction*. It has gone through a formal review and approval process and has been issued by CDOT's Construction Engineering Services Branch with formal instructions for its use on CDOT construction projects. It is to be used as written without change. Do not use modified versions of this special provision on CDOT construction projects, and do not use this special provision on CDOT projects in a manner other than that specified in the instructions unless such use is first approved by CDOT's Standards and Specifications Unit. The instructions for use on CDOT construction projects appear below.

Other agencies which use the *Standard Specifications for Road and Bridge Construction* to administer construction projects may use this special provision as appropriate and at their own risk.

Instructions for use on CDOT construction projects:
Use this standard special provision on all projects with structural concrete.

October 1, 2021

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REVISION OF SECTION 601
CONCRETE MIX DESIGNS

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.

March 18, 2022

REVISION OF SECTION 630
TRAFFIC CONTROL MANAGEMENT

NOTICE

This Standard Special Provision (SSP) revises or modifies CDOT's *Standard Specifications for Road and Bridge Construction*. These are the official instructions for its use on CDOT construction projects, and the Construction Engineering Services Branch has reviewed, approved, and issued it. Use as written without change. Do not use modified versions of this SSP on CDOT construction projects. Do not use this special provision on CDOT projects in a manner other than specified in the instructions without approval by CDOT's Standards and Specifications Unit. The instructions for use appear below.

Other agencies using the *Standard Specifications for Road and Bridge Construction* to administer construction projects may use this special provision appropriately and at their own risk.

Instructions for use on CDOT construction projects:
All projects with 630, Traffic Control Management.

March 18, 2022

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REVISION OF SECTION 630
TRAFFIC CONTROL MANAGEMENT

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.

November 2, 2021

REVISION OF SECTION 703
AGGREGATES

NOTICE

This Standard Special Provision (SSP) revises or modifies CDOT's *Standard Specifications for Road and Bridge Construction*. These are the official instructions for its use on CDOT construction projects, and have been reviewed, approved, and issued by the Construction Engineering Services Branch. Use as written without change. Do not use modified versions of this SSP on CDOT construction projects. Do not use this special provision on CDOT projects in a manner other than specified in the instructions without approval by CDOT's Standards and Specifications Unit. The instructions for use appear below.

Other agencies using the *Standard Specifications for Road and Bridge Construction* to administer construction projects may use this special provision appropriately and at their own risk.

Instructions for use on CDOT construction projects:
Use this standard special provision on all projects with Aggregates.

REVISION OF SECTION 703
AGGREGATES

Section 703 of the Standard Specifications is hereby revised for this project as follows.

Delete Section 703 and replace with the following:

703.00 General All sieve sizes and designations described in this section refer to laboratory sieves having square openings and conforming to ASTM E11.

The grading and composition requirements for coarse and fine aggregates for concrete**Error! Bookmark not defined.** are set forth in Table 703-1.

Table 703-1
CONCRETE AGGREGATE GRADATION TABLE

Percentage Passing Designated Sieves and Nominal Size Designation

Sieve Size	Coarse Aggregates (from AASHTO M43)									Fine Aggregate
	No. 3	No. 357	No. 4	No. 467	No. 57	No. 6	No. 67	No. 7	No. 8	
	50 mm to 25.0 mm (2" to 1")	50 mm to 4.75 mm (2" to No. 4)	37.5 mm to 19.0 mm (1½" to ¾")	37.5 mm to 4.75 mm (1½" to #4)	25.0 mm to 4.75 mm (1" to #4)	19.0 mm to 9.5 mm (¾" to 3/8")	19.0 mm to 4.75 mm (¾" to #4)	12.5 mm to 4.75 mm (½" to #4)	9.5 mm to 2.36 mm (3/8 " to #8)	4.75 mm to 150 µm (#4 to #100)
63 mm (2½")	100	100								
50 mm (2")	90–100	95–100	100	100						
37.5 mm (1½")	35–70		90–100	95–100	100					
25.0 mm (1")	0–15	35–70	20–55		95–100	100	100			
19.0 mm (¾")			0–15	35 – 70		90–100	90–100	100		
12.5 mm (½")	0–5	10–30			25–60	20–55		90–100	100	
9.5 mm (3/8")			0–5	10–30		0–15	20–55	40–70	85–100	100
4.75 mm (#4)		0–5		0–5	0–10	0–5	0–10	0–15	10–30	95–100
2.36 mm (#8)					0–5		0–5	0–5	0–10	80–100
1.18 mm (#16)				8970					0–5	50–85
600 µm (#30)										25–60
300 µm (#50)										10–30
150 µm (#100)										2–10

REVISION OF SECTION 703
AGGREGATES

703.01 Fine Aggregate for Concrete. Fine aggregate for concrete**Error! Bookmark not defined.** shall conform to the requirements of AASHTO M 6, Class A. The minimum sand equivalent, as tested in accordance with Colorado Procedure 37 shall be 80 unless otherwise specified. The fineness modulus, as determined by AASHTO T 27, shall not be less than 2.50 or greater than 3.50 unless otherwise approved.

703.02 Coarse Aggregate for Concrete. Coarse aggregate for concrete**Error! Bookmark not defined.** shall conform to the requirements of AASHTO M 80, Class A, except that the percentage of wear shall not exceed 45 when tested in accordance with AASHTO T 96.

703.03 Aggregate for Bases. Aggregates for bases except Aggregate Base Course (RAP) shall be crushed stone, crushed slag, crushed gravel, natural gravel, or crushed reclaimed concrete**Error! Bookmark not defined.**. Aggregate Base Course (RAP) shall be 100 percent crushed recycled asphalt pavement material. All materials except Aggregate Base Course (RAP) shall conform to the quality requirements of AASHTO M 147 except that the requirements for the ratio of minus 75 µm (No. 200) sieve fraction to the minus 425 µm (No. 40) sieve fraction, stated in 3.2.2 of AASHTO M 147, shall not apply

The requirements for the Los Angeles wear test (AASHTO T 96 and ASTM C535) shall not apply to Class 1, 2, and 3. Aggregates for bases shall meet the grading requirements of Table 703-2 for the class specified for the project, unless otherwise specified.

The liquid limit shall be as shown in Table 703-2 and the plasticity index shall not exceed six when the aggregate is tested in accordance with AASHTO T 89 and T 90 respectively.

Table 703-2
CLASSIFICATION FOR AGGREGATEBASE COURSE

Sieve Size	Mass Percent Passing Square Mesh Sieves						
	LL not greater than 35			LL not greater than 30			
	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7
150 mm (6")			100				
100 mm (4")		100					
75 mm (3")		95-100					
60 mm (2 ½")	100						
50 mm (2")	95-100			100			
37.5 mm (1 ½")				90-100	100		
25 mm (1")					95-100	100	100
19 mm (3/4")				50-90		95-100	
4.75 mm (#4)	30-65			30-50	30-70	30-65	
2.36 mm (#8)						25-55	20-85
75 µm (#200)	3-15	3-15	20 max	3-12	3-15	3-12	5-15
NOTE: Class 3 material shall consist of bank or pit run material.							

Aggregate Base Coarse (RAP) shall be 100 percent reclaimed asphalt pavement material conforming to the requirements of Table 703-3.

Table 703-3
CLASSIFICATION FOR RECLAIMED ASPHALT PAVEMENT AGGREGATE BASE COURSE

Sieve Size	Mass Percent Passing Square Mesh Sieves
	ABC (RAP)
50 mm (2")	100
25 mm (1")	85-100
19 mm (¾")	75-100
12.5 mm (½")	55-90
9.5 mm (⅜")	45-80
4.75 mm (#4)	25-55
1.18 mm (#16)	5-25
75 µm (#200)	0-5

703.04 Aggregates for Hot Mix Asphalt. Aggregates for hot mix asphalt (HMA) shall be of uniform quality, composed of clean, hard, durable particles of crushed stone, crushed gravel, natural gravel, or crushed slag. Excess of fine material shall be wasted before crushing. A percentage of the aggregate retained on the 4.75 mm (No. 4) sieve for Gradings S, SX and SG— and on the 2.36 mm (No. 8) sieve for Gradings SF and ST—shall have at least two mechanically induced fractured faces when tested in accordance with Colorado Procedure 45. This percentage will be specified in Table 403-1, as revised for the project in Section 403. The angularity of the fine aggregate shall be a minimum of 45.0 percent when determined according to AASHTO T 304. Grading SF mixes, when determined by the Region Materials Engineer**Error! Bookmark not defined.**, may not require fine aggregate angularity of 45.0 percent. Aggregate samples representing each aggregate stockpile shall be non-plastic if the percent of aggregate passing the 2.36 mm (No. 8) sieve is greater than or equal to 10 percent by weight of the individual aggregate sample. Plasticity will be determined in accordance with AASHTO T 90. The material shall not contain clay balls, vegetable matter, or other deleterious substances.

The aggregate for Gradings ST, S, SX, and SG shall have a percentage of wear of 45 or less when tested in accordance with AASHTO T 96.

Table 703-4
MASTER RANGE TABLE FOR HOT MIX ASPHALT

Sieve Size	Percent by Weight Passing Square Mesh Sieves				
	Grading SF	Grading ST	Grading SX	Grading S	Grading SG
37.5 mm (1½″)					100
25.0 mm (1″)				100	90 – 100
19.0 mm (¾″)			100	90 – 100	
12.5 mm (½″)		100	90 – 100	*	*
9.5 mm (⅜″)	100	90 – 100	*	*	*
4.75 mm (#4)	90 – 100	*	*	*	*
2.36 mm (#8)	*	28 – 58	28 – 58	23 – 49	19 – 45
1.18 mm (#16)	30 – 54				
600 µm (#30)	*	*	*	*	*
300 µm (#50)					
150 µm (#100)					
75 µm (#200)	2 – 12	2 – 10	2 – 10	2 – 8	1 – 7

* These additional Form 43 Specification Screens will initially be established using values from the As Used Gradation shown on the Design Mix.

Aggregates for stone matrix asphalt (SMA) shall be of uniform quality, composed of clean, hard, durable particles of crushed stone, crushed gravel, or crushed slag. A minimum of 90 percent of the particles retained on the 4.75 mm (No. 4) sieve shall have at least two mechanically induced fractured faces when tested in accordance with Colorado Procedure 45. The particles passing the 4.75 mm (No. 4) sieve shall be the product of crushing rock larger than 12.5 mm (1/2 inch) and shall be non-plastic when tested in accordance with AASHTO T 90.

Additionally, each source of aggregate for SMA shall meet the following requirements:

(1) No more than 30 percent when tested in accordance with AASHTO T 96 Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.

(2) No more than 12 percent when tested in accordance with AASHTO T 104 Soundness of Aggregate by Use of Sodium Sulfate.

Table 703-5
MASTER RANGE TABLE FOR STONE MATRIX ASPHALT

Sieve Size	Percent by Weight Passing Square Mesh Sieves			
	4.75 mm (#4) nominal	9.5 mm (3/8″) nominal	12.5 mm (1/2″) nominal	19.0 mm (3/4″) nominal
25 mm (1")				100
19.0 mm (¾")			100	90-100
12.5 mm (½")	100	100	90-100	50-88
9.5 mm (⅜")	100	90-100	50-80	25-60
4.75 mm (#4)	90-100	26-60	20-35	20-28
2.36 mm (#8)	28-65	20-28	16-24	16-24
1.18mm (#16)	22-36			
600 µm (#30)	18-28	12-18	12-18	12-18
300 µm (#50)	15-22	10-15		
150 µm (#100)				
75 µm (#200)	12-15	8-12	8-11	8-11

The aggregates for hot mix asphalt (HMA) and stone matrix asphalt (SMA) shall meet the requirements of Table 703-6 when tested in accordance with CP-L 4211 Resistance of Coarse Aggregate to Degradation by Abrasion in the Micro-Deval Apparatus. The Contractor**Error! Bookmark not defined.** shall be assessed a price reduction of $1,000 for each production sample of the combined aggregate with a value greater than 20 according to CP-L 4211.

Table 703-6
AGGREGATE DEGRADATION BY ABRASION
IN THE MICRO-DEVAL CP-L 4211

	Not to exceed
Combined Aggregate (Mix Design)	18
Combined Aggregate (1/10,000 tons, or fraction thereof during production)	20

703.05 Aggregate for Cover Coat Material. Aggregates for cover coat material shall be crushed stone, crushed slag, crushed gravel, or natural gravel. Aggregates shall be composed of clean, tough, durable fragments free from an excess of flat, elongated, soft, or disintegrated pieces and free from fragments coated with dirt or other objectionable matter. Slag shall be air-cooled blast-furnace slag reasonably uniform in density.

The aggregate shall conform to the following requirements:

(1) The percentage of wear, Los Angeles Abrasion Test (AASHTO T 96), shall not be more than 35.

(2) The maximum amount of flat and elongated aggregate with a ratio of 3:1 shall not exceed 12 percent as determined by ASTM D4791.

(3) When blast-furnace slag is used, the weight per cubic foot shall be at least 70 pounds.

(4) For Type I, II, or IV cover coat material, 90 percent by weight of the particles retained on the 4.75 mm (No. 4) sieve shall have at least two fractured faces when tested in accordance with Colorado Procedure 45.

(5) Lightweight aggregate used for cover coat material shall be an aggregate prepared by expanding shale, clay, or slate in a rotary fired kiln. Lightweight aggregate shall have a dry loose unit weight of 35 to 55 pounds per cubic foot determined in accordance with AASHTO T 19, Shoveling Procedure. The total mass of the test sample of lightweight aggregate used in AASHTO T 96 (Los Angles Abrasion) shall be 2,000 g.

Table 703-7
GRADATION SPECIFICATIONSERROR! BOOKMARK NOT DEFINED. **FOR COVER COAT AGGREGATE**

Sieve Size	Percent by Weight Passing Square Mesh Sieve		
	9.5 mm (⅜") Type 1	**12.5 mm (½") Type II**	**19.0 mm (¾")* Type IV**
19.0 mm (¾")			100
12.5 mm (½")		100	95-100
9.5 mm (⅜")	100	70-100	60-80
4.75 mm (#4)	0-15	0-4	0-10
75 µm (#200)	0-1.5	0-1.5	0-1.5
*Type IV shall be used only with lightweight aggregates.			

703.06 Mineral Filler. Mineral filler shall conform to the requirements of AASHTO M 17 and shall consist of rock dust, slag dust, hydrated lime, hydraulic cement, fly ash, or other suitable mineral matter. It shall be free of organic impurities and agglomerations. When used, it shall be dry enough to flow freely.

Mineral filler shall be graded within the following limits:

Sieve Size	Mass Percent Passing
600 µm (No. 30)	100
300 µm (No. 50)	95-100
75 µm (No. 200)	70-100

Mineral filler shall have a plasticity index not greater than four excluding hydrated lime and hydraulic cement.

If mineral filler other than limestone dust is used in stone matrix asphalt (SMA) it shall consist of mineral matter that meets the requirements of Tables 703-8, 703-9 and the following:

Alternative mineral filler shall consist of finely divided mineral matter such as rock dust, slag dust, fly ash, loess, or other suitable mineral matter. Calcium oxide content of any mineral filler shall not exceed 22 percent.

Alternative mineral filler test data shall be provided as part of the SMA mix design submittal and as required in Table 703-8 during production.

The Contractor**Error! Bookmark not defined.** shall sample and test alternative mineral filler at the frequencies listed in Table 703-8. Production will be suspended if alternative mineral filler test results fail to meet requirements. The Contractor shall submit written plans to correct the mineral filler operation to the Engineer**Error! Bookmark not defined.** for approval prior to commencing paving**Error! Bookmark not defined.**.

Table 703-8
REQUIRED TESTING FOR ALTERNATIVE SMA MINERAL FILLERS

Type of Test	**Contractor**Error! Bookmark not defined. **Testing Frequency**	**Specification Limit**	**Remarks**
Plasticity Index AASHTO T90	One per 10,000 tons of SMA placed♦	4% Maximum	▲
Hydrometer Analysis AASHTO T88	One at Mix Design submittal	Report	
Gradation AASHTO T37	One per 10,000 tons of SMA placed♦	Table 703-9	▲
Calcium Oxide Content ASTM C25	One at Mix Design submittal	22% Maximum	
Modified Rigden Voids – NAPA Publication IS-101	One per 10,000 tons of SMA placed♦	Shall not exceed 50	▲

♦ The minimum frequency shall be twice per project

▲ Sampling of alternative mineral fillers shall be at the point of introduction to the SMA and a split sample shall be submitted to the Engineer**Error! Bookmark not defined.**

Table 703-9
ALTERNATIVE SMA MINERAL GRADATION

(AASHTO M17/ASTM D242-95)	
Sieve	**Percent Passing**
600 µm (#30)	100
300 µm (#50)	95 - 100
75 µm (#200)	70 - 100

703.07 Bed Course Material.

(a) Bed course material for sidewalks, curbing, and bikeways shall consist of cinders, sand, slag, gravel, crushed stone, or other approved material of such gradation that all particles shall pass through a sieve having 19.0 mm (3/4 inch) square openings.

(b) Bed course material for slope protection, or riprap filter blanket shall be a porous, free draining material consisting of sand, gravel, cinders, slag, crushed stone, or other approved free draining material. This material shall meet the following gradation requirements:

Sieve Size	Mass Percent Passing Square Mesh Sieves
75 mm (3 inch)	100
4.75 mm (No. 4)	20-65
75 µm (No. 200)	0-10

703.08 Structure Backfill Material.

(a) Class 1 structure backfill shall meet the following gradation requirements:

Sieve Size	Mass Percent Passing Square Mesh Sieves
50 mm (2 inch)	100
4.75 mm (No. 4)	30-100
300 µm (No. 50)	10-60
75 µm (No. 200)	5-20

In addition, this material shall have a liquid limit not exceeding 35 and a plasticity index of not over six when determined in conformity with AASHTO T 89 and T 90 respectively.

(b) Class 2 structure backfill shall be composed of suitable materials developed on the project. To be suitable for use under this classification, backfill shall be free of frozen lumps, wood, or other organic material. If the material contains rock fragments that, in the opinion of the Engineer**Error! Bookmark not defined.**, will be injurious to the structure, the native material shall not be used for backfilling and the Contractor**Error! Bookmark not defined.** shall furnish Class 1 structure backfill material at the contract unit price. If contract unit price does not exist for Class 1 structure backfill, it will be paid for in accordance with subsection 104.03.

(c) Class 3 structure backfill shall be a sandy gravel and meet the following gradation:

Sieve Size	Mass Percent Passing Square Mesh Sieves
9.5 mm (3/8 inch)	90-100
4.75 mm (No. 4)	45-80
0.075 mm (No. 200)	5-12

703.09 Filter Material. Filter material shall consist of free draining sand, gravel, slag, or crushed stone. The grading requirements are set forth in Table 703-10.

Table 703-10
GRADATION SPECIFICATIONSERROR! BOOKMARK NOT DEFINED. **FOR FILTER MATERIAL**

Sieve Size	Mass Percent Passing Square Mesh Sieves		
	Class A	**Class B**	**Class C**
75 mm (3")	100		
37.5 mm (1½")		100	
19.0 mm (¾")	20-90		100
4.75 mm (No. 4)	0-20	20-60	60-100
1.18 µm (No. 16)		10-30	
300 µm (No. 50)		0-10	10-30
150 µm (No. 100)			0-10
75 µm (No. 200)	0-3	0-3	0-3

703.10 Aggregate for Median Cover. Aggregate for median cover shall consist of clean crushed stone, crushed gravel, or natural gravel. The percentage of wear, when tested in accordance with AASHTO T 96, shall not be more than 70. The grading requirements shall be as follows:

Sieve Size	Mass Percent Passing Square Mesh Sieves
63 mm (2 1/2 inch)	100
50 mm (2 inch)	95-100
19.0 mm (3/4 inch)	0-15

October 1, 2021

AFFIRMATIVE ACTION REQUIREMENTS
EQUAL EMPLOYMENT OPPORTUNITY

NOTICE

This is a standard special provision that revises or modifies CDOT's *Standard Specifications for Road and Bridge Construction*. It has gone through a formal review and approval process and has been issued by CDOT's Project Development Branch with formal instructions for its use on CDOT construction projects. It is to be used as written without change. Do not use modified versions of this special provision on CDOT construction projects, and do not use this special provision on CDOT projects in a manner other than that specified in the instructions unless such use is first approved by the Standards and Specifications Unit of the Project Development Branch. The instructions for use on CDOT construction projects appear below.

Other agencies which use the *Standard Specifications for Road and Bridge Construction* to administer construction projects may use this special provision as appropriate and at their own risk.

Instructions for use on CDOT construction projects:

Use this standard special provision on all projects.

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			

AFFIRMATIVE ACTION REQUIREMENTS
EQUAL EMPLOYMENT OPPORTUNITY

These goals are applicable to all the Contractor's construction work (whether or not it is Federal or federally assisted) performed in the covered area. If the Contractor performs construction work in a geographical area located outside of the covered area, it shall apply the goals established for such geographical area where the work is actually performed. With regard to this second area, the Contractor also is subject to the goals for both its federally involved and non-federally involved construction.

The Contractor's compliance with the Executive Order and the regulations in 41 CFR Part 60-4 shall be based on its implementation of the Equal Opportunity Clause specific affirmative action obligations required by the specifications set forth in 41 CFR 60-4.3(a), and its efforts meet the goals established for the geographical area where the contract resulting 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.

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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.

October 1, 2021

DISADVANTAGED BUSINESS ENTERPRISE (DBE) REQUIREMENTS (LOCAL AGENCY)

NOTICE

This is a standard special provision that revises or modifies CDOT's *Standard Specifications for Road and Bridge Construction*. It has gone through a formal review and approval process and has been issued by CDOT's Project Development Branch with formal instructions for its use on CDOT Local Public Agency construction projects. It is to be used as written without change. Do not use modified versions of this special provision on CDOT Local Public Agency construction projects, and do not use this special provision on projects in a manner other than that specified in the instructions unless such use is first approved by the Standards and Specifications Unit of the Project Development Branch. The instructions for use on CDOT Local Public Agency construction projects appear below.

Instructions for use on Local Public Agency construction projects:

Use this Standard Special Provision on Local Agency administered Federal-Aid Design-Bid-Build Projects. For purposes of this Standard Special Provision, Federal Aid Design Bid Build Projects only include those projects for which the construction portion is funded in whole or in part with federal funds.

Use in conjunction with the Project Special Provision Worksheet, Disadvantaged Business Enterprise (DBE) Contract Goal.

The Local Public Agency should consult with the Regional Civil Rights Office (RCRO) to determine the use of this standard special and to obtain the contract goal. A contract goal of zero still requires the use of this standard special and the worksheet. Local Public Agencies shall not set their own contract goal.

This standard special provision should not be used for CM/GC services, design-build or other innovative projects. For DBE provisions for these projects, contact the Civil Rights and Business Resource Center (CRBRC) at (303)757-9234.

DISADVANTAGED BUSINESS ENTERPRISE (DBE) REQUIREMENTS (LOCAL AGENCY)

1. Overview

The Disadvantaged Business Enterprise (DBE) Program is a federally-mandated program that seeks to ensure non-discrimination in the award of U.S. Department of Transportation (DOT)-assisted contracts and to create a level playing field on which DBEs can compete fairly for DOT-assisted contracts. Local Public Agencies (LPAs) that receive federal funds, must comply with CDOT's DBE program. To such end, CDOT sets a contract goal for DBE participation for each DOT-assisted LPA Contract.

In order to be awarded the Contract, the bidder shall show that it has committed to DBE participation sufficient to meet the goal or has otherwise made good faith efforts to do so. CDOT will amend the goal prior to award if the lowest apparent bidder demonstrates that good faith efforts were made but sufficient commitments to meet the goal could not be obtained.

CDOT and the LPA will monitor the progress of the Contractor throughout the project to ensure that the Contractor's DBE commitments are being fulfilled. Modifications to the commitments must be approved by the CDOT Regional Civil Rights Office (RCRO). CDOT may withhold payment or seek other contractual remedies if the Contractor is not complying with the requirements of this special provision. Upon completion of the Contract, CDOT may require the LPA to reduce the final payment to the Contractor if the Contractor has failed to fulfill the commitments or made good faith efforts to meet the contract goal.

For general assistance regarding the DBE program and compliance, contact CDOT's Civil Rights and Business Resource Center (CRBRC) at (303)757-9234. For project specific issues, contact the LPA Engineer or RCRO.

All forms referenced herein can be found on the CDOT website in the forms library.

2. Contract Assurance

By submitting a proposal for this Contract, the bidder agrees to the following assurance and shall include it verbatim in all (including non-DBE) subcontracts:

The contractor, subrecipient or subcontractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. The contractor shall carry out applicable requirements of 49 CFR part 26 in the award and administration of DOT-assisted contracts. Failure by the contractor to carry out these requirements is a material breach of this contract, which may result in the termination of this contract or such other remedy as the recipient deems appropriate, which may include, but is not limited to: (1) Withholding monthly progress payments; (2) Assessing sanctions; (3) Liquidated damages; and/or (4) Disqualifying the contractor from future bidding as non-responsible.

3. Definitions

Terms not defined herein shall have the meaning provided in the CDOT Standard Specifications for Road and Bridge Construction.

A. *Commitment.* A commitment is a portion of the Contract, identified by dollar amount and work area, designated by the bidder or Contractor for participation by a particular DBE. Commitments are submitted to CDOT via Form 1414, Anticipated DBE Participation Plan, or via Form 1420, DBE Plan Modification Request. Once approved, commitments are enforceable obligations of the Contract.

B. *Commercially Useful Function (CUF).* Responsibility for the execution of the work and carrying out such responsibilities by actually performing, managing and supervising the work as further described in Section 8 below.

C. *Contract Goal.* The percentage of the contract designated by CDOT for DBE participation. The contract goal for this contract is provided in the Project Special Provision Disadvantaged Business Enterprise Contract Goal.

(1) The bidder/Contractor shall make good faith efforts to fulfill the contract goal with eligible DBE participation. For determining whether the contract goal was met prior to award, the contract goal shall be based upon the proposal amount excluding force account items. For determining whether the contract goal was met during and upon completion of the project, the contract goal shall be based upon the total earnings amount.

(2) If the lowest apparent bidder demonstrates that it was unable to meet the contract goal but made good faith efforts to do so, the contract goal will be amended and the revised contract goal will be provided on Form 1417, Approved DBE Participation Plan.

D. *Disadvantaged Business Enterprise (DBE).* A Colorado-certified Disadvantaged Business Enterprise listed on the Colorado Unified Certification Program (UCP) DBE Directory at www.coloradodbe.org.

E. *DBE Program Manual.* The manual maintained by the CRBRC which details CDOT's policies and procedures for administering the DBE program. A copy of the DBE Program Manual is available on the CRBRC webpage.

F. *Eligible Participation.* Work by a DBE that counts toward fulfillment of the contract goal as described in Section 4 below.

G. *Good Faith Efforts.* All necessary and reasonable steps to achieve the contract goal which, by their scope, intensity, and appropriateness to the objective, could reasonably be expected to obtain sufficient DBE participation, even if not fully successful. Good faith efforts are evaluated prior to award and throughout performance of the Contract. For guidance on good faith efforts, see 49 CFR Part 26, Appendix A.

H. *Joint Check.* A check issued by the Contractor or one of its subcontractors to a DBE firm and a material supplier or other third party for materials or services to be incorporated into the work.

I. *Reduction.* A reduction occurs when the Contractor reduces a commitment to a DBE. A reduction constitutes a partial termination.

J. *Subcontractor.* An individual, firm, corporation or other legal entity to whom the Contractor sublets part of the Contract. For purposes of this special provision, the term subcontractor includes suppliers.

K. *Substitution.* Substitution occurs when a Contractor seeks to find another DBE to perform work on the contract as a result of a reduction or termination.

L. *Termination.* A termination occurs when a Contractor no longer intends to use a DBE for fulfillment of a commitment.

M. *Total Earnings Amount:* Amount of the Contract earned by the Contractor, including approved changes and approved force account work performed, but not including any deductions for liquidated damages, price reduced material, work time violations, overweight loads or liens. The amount of the Contract earned does not include plan force account items (i.e. OJT, pavement incentives, etc).

N. *Work Code.* A code to identify the work that a DBE is certified to perform. A work code includes a six digit North American Industry Classifications System code plus a descriptor. Work codes are listed on a firm's profile on the UCP DBE Directory. The Contractor may contact the CRBRC to receive guidance on whether a work code covers the work to be performed.

4. Eligible Participation

The following rules will be used to determine whether work performed by a DBE qualifies as eligible participation on the Contract:

A. *Work Must be Identified in Commitment.* The work performed by the DBE must be reasonably construed to be included in the work area and work code identified by the Contractor in the approved commitment.

(1) If the Contractor intends to use a DBE for work that was not listed in the commitment, the Contractor shall submit Form 1420, DBE Participation Plan Modification for approval of the modification. Unapproved work will not count toward the contract goal.

(2) A DBE commitment cannot be modified to include work for which the DBE was not certified at the time of the approval of the original commitment.

B. *DBE Must be Certified to Perform the Work.* The DBE must be certified to perform the work upon submission of the commitment and upon execution of the DBE's subcontract.

(1) When a commitment has been made, but upon review of Form 205, Sublet Permit, CDOT determines that the DBE is no longer certified in the work code which covers the work to be performed, the Contractor may not use the DBE's participation toward the contract goal. The Contractor shall terminate the DBE commitment and seek substitute DBE participation in accordance with Section 9 below.

(2) A DBE's work will continue to count as eligible participation if the DBE was certified upon approval of Form 205, Sublet Permit and the certification status changes during the performance of the work.

(3) Suppliers must be certified upon execution of the purchase order.

C. *DBE Performs the Work*. Eligible participation will only include work actually performed by the DBE with its own forces.

(1) Work performed by the DBE includes the cost of supplies and materials obtained by the DBE for its work on the Contract, including any equipment leased by the DBE, provided that such supplies or equipment are not purchased or leased from the Contractor or a subcontractor that is subletting to the DBE.

(2) The term "work actually performed by the DBE with its own forces" includes work by temporary employees, provided such employees are under the control of the DBE.

(3) If CDOT or the LPA determines that a DBE has not performed a CUF on the project, no participation by such DBE shall count toward the contract goal.

D. *DBE Subcontracts to Another Firm.* When a DBE subcontracts part of the work, the value of the subcontracted work may only be counted toward the goal if the subcontractor is a DBE. Performance by non-DBE subcontractors, including non-DBE trucking firms and owner-operators, shall be deducted from the DBE's participation.

E. *DBE Received Payment for the Work.* Eligible participation only includes work for which the DBE has received payment, including the release of its retainage.

F. *Special Calculations for Suppliers.* When a DBE supplies goods on a project, the DBE may be classified as a manufacturer, dealer or broker. The DBE's status as a manufacturer, dealer or broker is determined on a contract-by-contract basis and is based upon the actual work performed.

(1) When a DBE is deemed to be acting as a manufacturer, one hundred percent of the

commitment will count as eligible participation.

(2) When a DBE is deemed to be acting as a regular dealer (i.e. non-manufacturer supplier), only sixty percent of the commitment will count as eligible participation.

(3) When a DBE is deemed to be acting as a broker, only the reasonable brokerage fee will count as eligible participation.

G. *Reasonable Fee for Contract-Specific Services.* Services shall count toward the contract goal only if they are specifically required for the performance of the Contract. Non-contract specific expenses may not be counted toward the contract goal. Fees for services must be reasonable. Services include but are not limited to professional services, public involvement, etc. In the case of temporary employment placement agencies, only the placement fee for an individual to be specifically and exclusively used for work on the contract shall count as eligible participation.

H. *Pre-Approval for Joint Venture Participation.* When a DBE is a participant in a joint venture, the DBE must apply to CDOT to determine how much of the work performed by the joint venture will count toward the contract goal. The DBE shall complete Form 893, Information for Determining DBE Participation when a Joint Venture Includes a DBE. Form 893 shall be submitted to CDOT CRBRC no less than ten days before the submission of the Proposal or to the RCRO no less than ten days before submission of the Form 205 to ensure sufficient time for review.

5. Proposal Requirements

In order to be eligible for award, the following shall be submitted with the proposal to the LPA:

A. *Form 1413, Bidders List.* The bidder shall list each subcontractor (including both DBE and non-DBE subcontractors) that submitted a quote for participation on the project. Failure to submit a signed Form 1413 will result in rejection of the proposal.

B. *Form 1414, Anticipated DBE Participation Plan*. If the Contract Goal is greater than zero, the bidder shall submit Form 1414 to document anticipated DBE participation.

(1) If the Bidder has not obtained any DBE commitments, it shall still submit Form 1414 documenting zero anticipated participation. If the Contract Goal is greater than zero, failure to submit a signed Form 1414 shall result in rejection of the proposal.

(2) The bidder shall list the DBE, work area(s), commitment amount and estimated eligible participation for each commitment. Once Form 1414 is submitted, a commitment may only be terminated or reduced in accordance with Section 9 below. The bidder is responsible for ensuring that commitments, and the estimated eligible participation resulting therefrom, have been properly calculated prior to submitting its proposal.

(3) If the bidder is a DBE, the bidder must include itself in Form 1414 and list the work area(s) and amount that it intends to self-perform and count as eligible participation on the contract.

(4) Commitments may be made to second tier or lower DBE subcontractors; however, the Contractor is ultimately responsible for the fulfillment of the commitment and shall sign the Form 1415, Commitment Confirmation.

6. Additional Forms Due Prior to Award.

If the contract goal is greater than zero, or if the bidder has voluntarily made commitments, the Bidder shall submit the following forms to the LPA within five calendar days of selection as the lowest apparent bidder. These forms must be submitted to the CDOT CRBRC concurrent with the request for concurrence to award.

A. *Form 1415, Commitment Confirmation*. A Form 1415, Commitment Confirmation shall be obtained from each DBE listed on Form 1414. The bidder shall complete Section 1 and the DBE shall complete Section 2 of Form 1415. Form 1415s shall be consistent with the commitments listed on Form 1414. The bidder shall not modify commitments listed on Form 1414 without good cause and approval from CDOT. The bidder shall contact CDOT if any issues arise which may require the bidder to alter or terminate a commitment.

B. *Form 1416, Good Faith Effort Report.* If the total eligible participation listed on Form 1414 does not meet the contract goal, the lowest apparent bidder shall also submit Form 1416, Good Faith Effort Report and any supporting documentation that the bidder would like considered by CDOT as evidence of good faith efforts.

7. Commitment and Good Faith Effort Review

A. *Commitment Review*. CDOT will evaluate the Form 1414 and each Form 1415 to ensure that it the commitment is valid and has been properly calculated. CDOT may investigate or request additional information in order to confirm the accuracy of a commitment. If CDOT determines that the total estimated eligible participation of the commitments does not meet the contract goal, within two business days of notice from CDOT, the bidder shall submit Form 1416 to CDOT.

B. *Good Faith Effort Review.* If the total eligible participation of Form 1414 and all supporting Form 1415s does not meet the contract goal, CDOT will review Form 1416 and all supporting documentation submitted by the bidder in order to determine whether the bidder has demonstrated good faith efforts to obtain DBE participation. CDOT will use 49 CFR Part 26, Appendix A as a guide for determining whether the bidder made good faith efforts to meet the contract goal. A bidder will be deemed to not have made good faith efforts if the bidder lists a DBE for a work area for which the DBE is not certified and the bidder cannot establish a reasonable basis for its determination. CDOT may consider and approve commitments made after submission of the bid if the Bidder demonstrates that (1) good faith efforts were made prior to submission of the bid and (2) there is a reasonable justification for not obtaining the commitments prior to submission of the bid.

C. *Administrative Reconsideration.* If CDOT determines that the bidder did not demonstrate good faith efforts to meet the contract goal, it will provide the bidder and LPA with written notice of its determination. The bidder will be provided an opportunity to request administrative reconsideration of the decision. The process for reconsideration is set forth in the *Good Faith Effort Appeal Process,* which is an Appendix I to the DBE Program Manual. A copy of the *Good Faith Effort Appeal Process* will be included in the written notice from CDOT.

D. *Form 1417, Approved DBE Participation Plan.* If CDOT determines that the bidder has met the contract goal or made good faith efforts to do so, CDOT will issue to the bidder, with a copy to the LPA, Form 1417, Approved DBE Participation Plan, documenting the approved commitments. If CDOT determines that the bidder did not meet the contract goal but made good faith efforts to do so, via the Form 1417 CDOT will amend the contract goal in accordance with the commitments that were obtained and attach an explanation of its determination.

8. Ongoing Oversight of DBE Participation

A. *Consistency Review.* CDOT will review Form 205, Sublet Permit Application to determine whether the work being sublet is consistent with the DBE commitments. CDOT may withhold approval of the sublet or direct the LPA to stop performance of the work if the Contractor has reduced, terminated, or otherwise modified the type or amount of work to be performed by a DBE without seeking prior approval.

B. *Form 1419, DBE Participation Report.* The Contractor shall submit Form 1419, DBE Participation Report to the LPA Engineer on a quarterly basis (January 15, April 15, July 15, and October 15) and upon completion of the Contract. The LPA may withhold progress payments if the quarterly Form 1419 is not received on time. The LPA will not provide final payment on the Contract until the final Form 1419 has been reviewed and approved by the CDOT RCRO.

C. *Joint Checks*. All joint checks must be approved by the CDOT RCRO before they are used in payment to a DBE. Joint checks used in payments to DBEs will be monitored closely to ensure (1) the DBE is performing a CUF and (2) the joint checks are not being used in a discriminatory manner. The Contractor shall request approval for the use of a joint check in a written letter signed by the DBE and the Contractor, stating the reason for the joint checks and the approximate number of checks that will be needed.

D. *Commercially Useful Function*. CDOT will monitor performance during the Contract to ensure each DBE is performing a CUF. If CDOT or the LPA determines that a DBE is not performing a CUF, no work performed by such DBE shall count as eligible participation. The DBE, Contractor, and any other involved third parties may also be subject to additional enforcement actions.

(1) When determining whether a DBE is performing a CUF, CDOT and the LPA will consider the amount of work subcontracted, industry practices, the amount the firm is to be paid compared to the work performed and eligible participation claimed, and any other relevant factors.

(2) With respect to material and supplies used on the Contract, in order to perform a CUF the DBE must be responsible for negotiating price, determining quality and quantity, ordering the material, installing the material, if applicable, and paying for the material itself.

(3) With respect to trucking, in order to perform a CUF, the DBE trucking firm must own and operate at least one fully licensed, insured and operational truck used on the Contract. Additionally, the DBE trucking firm must be responsible for the management and supervision of the entire trucking operation for which it is responsible on the Contract.

(4) A DBE does not perform a CUF when its role is limited to that of an extra participant in a transaction, contract or project through which funds are passed in order to obtain the appearance of DBE participation. CDOT will evaluate similar transactions involving non-DBEs in order to determine whether a DBE is an extra participant.

(5) If a DBE does not perform or exercise responsibility for at least 30 percent of the total cost of its contract with its own work force, or the DBE subcontracts a greater portion of the work than would be expected on the basis of normal industry practice for the type of work involved, CDOT and the LPA will presume that the DBE is not performing a CUF. The DBE may present evidence to rebut this presumption.

9. DBE Participation Plan Modifications

A. *Contractor must Use DBEs Listed in Approved Plan.* The Contractor shall utilize the specific DBEs listed to perform the work and supply the materials for which it is listed unless the Contractor obtains the CDOT RCRO's written consent to terminate, reduce or modify the commitment. Unless CDOT grants such consent, the Contractor will not be entitled to payment for the work or materials. Failure to carry out the requirements of this section is a material breach of the Contract and may result in the termination of the Contract or other remedies established by CDOT or the LPA.

B. *Form 1420, DBE Participation Plan Modification Request***.** During the performance of the Contract, the Contractor shall use Form 1420, DBE Participation Plan Modification Request to communicate all requests for termination, reduction, substitution, and waivers to the CDOT RCRO. One Form 1420 may include multiple requests and must be submitted at the time of the occurrence or, if that is not possible, within a reasonable time of the occurrence requiring termination, reduction, substitution or waiver.

C. *Commitment Terminations and Reductions.* No commitment shall be terminated or reduced without CDOT's approval. Terminations and reductions include, but are not limited to, instances in which a Contractor seeks to perform work originally designated for a DBE subcontractor with its own forces, those of an affiliate, a non-DBE firm or with another DBE firm. In order to receive approval, the Contractor shall:

(1) Have good cause for termination or reduction. Good cause may include:

(i) the DBE fails or refuses to execute a written contract;

(ii) the DBE fails or refuses to perform the work of its subcontract consistent with normal industry standards, provided that such failure is not the result of bad faith or discriminatory actions of the Contractor or one of its subcontractors;

(iii) the DBE fails to meet reasonable, nondiscriminatory bond requirements;

(iv) the DBE becomes bankrupt, insolvent, or exhibits credit unworthiness;

(v) the DBE is ineligible to work because of suspension or debarment proceedings or other state law;

(vi) the DBE is not a responsible contractor;

(vii) the DBE voluntarily withdraws from the project and provides written notice to CDOT,

(viii) the DBE is ineligible to receive DBE credit for the work required;

(ix) the DBE owner dies or becomes disabled and is unable to complete the work;

(x) the DBE ceases business operations or otherwise dissolves;

(xi) or other documented good cause that compels termination. Good cause does not exist if the Contractor seeks to terminate a DBE it relied upon to obtain the contract so that the Contractor can self-perform the work for which the DBE was engaged or so that the Contractor can substitute another DBE or non-DBE contractor after contract award.

(2) Provide the DBE notice of the Contractor's intent to terminate or reduce the commitment and the reason for such termination or reduction, with a copy to the CDOT RCRO and LPA;

(3) In the notice of intent, provide the DBE at least five calendar days to respond to the notice and inform CDOT and the Contractor of the reasons, if any, why it objects to the proposed termination or reduction and any reasons that it shall not be approved. The Contractor is not required to provide the five calendar days written notice in cases where the DBE in question has provided written notice that it is withdrawing from the subcontract or purchase order. The notice period may be reduced by the CDOT RCRO if required by public necessity.

(4) Following the notice period, if the Contractor decides to proceed, submit Form 1420 requesting approval of the termination or reduction.

(5) When a commitment is terminated or reduced (including when a DBE withdraws), make good faith efforts to find another DBE to substitute. These good faith efforts shall be directed at finding another DBE to perform at least the same amount of work under the contract as the participation that was terminated or reduced up to the contract goal.

D. *Contract Changes.* In the event of a contract change:

(1) If the LPA eliminates or reduces work committed to a DBE, such change shall be considered good cause for termination or reduction in accordance with Section 9.B above. The Contractor shall follow the processes outlined in Section 9.B.

(2) If the LPA issues a change which increases or adds new work items, the Contractor shall ensure that it has obtained sufficient DBE participation to meet the Contract Goal, or has made good faith efforts to do so.

E. *Process for Substitution or Increase in Participation to Meet the Contract Goal.* When the Contractor must obtain additional DBE participation to meet the Contract Goal, whether resulting from an approved termination or reduction or a change to the Contract, the Contractor shall:

(1) Increase the participation of a DBE for any work items previously identified in an approved commitment without seeking CDOT approval; provided, however, that at its discretion, the CDOT RCRO may request a Form 1420 documenting such additional participation; or

(2) If the Contractor needs to add new work to a commitment or obtain additional participation from a DBE that is not already participating on the contract pursuant to an approved commitment, submit a Form 1420 and Form 1415 to the RCRO requesting approval of the additional participation; or

(3) If the Contractor determines that additional DBE participation cannot be obtained, submit a Form 1420 to the RCRO requesting waiver of the participation. The Contractor shall include its justification for not obtaining additional participation and, at its discretion, CDOT may require additional information regarding the efforts of the Contractor. If the Contractor has not obtained substitute participation, the RCRO may require the Contractor to submit evidence of good faith efforts to substitute. The contractor shall have seven days to submit such information. This period may be extended at the discretion of the RCRO.

10. Payment Reduction

The Contractor's retainage will not be released until the CDOT RCRO has determined whether the Contractor will be subject to a payment reduction. Payment reductions will be calculated as follows:

A. *Failure to Fulfill Commitments.* If the Contractor terminated or reduced a commitment, the Contractor will be subject to a payment reduction for any termination or reduction which was not approved via a Form 1420.

B. *Failure to Meet Contract Goal.* If the Contractor failed to meet the contract goal, the Contractor will be subject to a payment reduction for the portion of the contract goal that was not met and was not waived via an approved Form 1420.

C. *Duplication.* The contractor will not be subject to duplicate reduction for the same offense.

D. *Adjustments.* CDOT may adjust the payment reduction wherein the Contractor demonstrates that its failure to obtain DBE participation was due to circumstances outside of its control.

11. Other Enforcement

A. *Investigations.* As it determines necessary, CDOT or the LPA may conduct reviews or investigations of participants. All participants, including, but not limited to, DBE firms and applicants for DBE certification, complainants, and contractors using DBE firms to meet contract goals, are required to cooperate fully and promptly with compliance reviews, certification reviews, investigations, and other requests for information.

B. *Intimidation and retaliation.* Participants shall not intimidate, threaten, coerce, or discriminate against any individual or firm for the purpose of interfering with any right or privilege secured by the DBE program or because the individual or firm has made a complaint, testified, assisted, or participated in any manner in an investigation, proceeding, or hearing under the DBE program.

C. *Consequences of Non-Compliance.* Failure to comply with subsections 11 A. or 11 B. shall be a ground for appropriate action against the party involved (e.g., with respect to recipients, a finding of noncompliance; with respect to DBE firms, denial of certification or removal of eligibility and/or suspension and debarment; with respect to a complainant or appellant, dismissal of the complaint or appeal; with respect to a contractor which uses DBE firms to meet goals, findings of non-responsibility for future contracts and/or suspension and debarment).

D. *Fraud and Misrepresentation*. If CDOT or the LPA determines that a Contractor or subcontractor was a knowing and willing participant in any intended or actual subcontracting arrangement contrived to artificially inflate DBE participation or any other business arrangement determined by CDOT or the LPA to be unallowable, or if the Contractor engages in repeated violations, falsification or misrepresentation, CDOT may:

(1) refuse to count any fraudulent or misrepresented DBE participation;

(2) withhold progress payments to the Contractor commensurate with the violation;

(3) suspend or reduce the Contractor's prequalification status;

(4) refer the matter to the Office of Inspector General of the US Department of Transportation for investigation; or

(5) seek any other available contractual remedy.

February 25, 2022

U.S. DEPT. OF LABOR DAVIS BACON MINIMUM WAGES COLORADO HIGHWAY CONSTRUCTION GENERAL DECISION NUMBER – CO20220006

NOTICE

This is a standard special provision that revises or modifies CDOT's *Standard Specifications for Road and Bridge Construction*. It has gone through a formal review and approval process and has been issued by CDOT's Construction Engineering Services with formal instructions for its use on CDOT construction projects. It is to be used as written without change. Do not use modified versions of this special provision on CDOT construction projects, and do not use this special provision on CDOT projects in a manner other than that specified in the instructions, unless such use is first approved by the Standards and Specification Unit of the Project Development Branch. The instructions for use on CDOT construction projects appear below.

Other agencies which use the *Standard Specifications for Road and Bridge Construction* to administer construction projects may use this special provision as appropriate and at their own risk.

Instructions for use on CDOT construction projects:

Use this standard special provision on all federal-aid projects with contracts exceeding $2000, except for non-ARRA projects on roadways classified as local roads or rural minor collectors, which are exempt. Projects on local roads, rural minor collectors, and enhancement projects funded with ARRA funds are not exempt.

Decision Nos. CO20220006 dated January 7, 2022 supersedes **Decision Nos. CO20210006** dated January 1, 2021.	**Modifications**			**ID**
	MOD Number	**Date**	**Page Number(s)**	
When work within a project is located in two or more counties and the minimum wages and fringe benefits are different for one or more job classifications, the higher minimum wages and fringe benefits shall apply throughout the project.	**1**	**2/25/22**	**2, 3, 4, 8, and 9**	**1**
General Decision No. CO20220006 applies to the following counties: Adams, Arapahoe, Broomfield, Clear Creek, Elbert, Gilpin, Jefferson, and Park counties.				

General Decision No. CO20220006

The wage and fringe benefits listed below reflect collectively bargained rates.

Code	Classification	Basic Hourly Rate	Fringe Benefits	Last Mod
	ELECTRICIAN (Traffic Signalization Only):			
1000	Clear Creek	32.35	16.75+6.58	
	POWER EQUIPMENT OPERATOR:			
	Drill Rig Caisson			
1001	Smaller than Watson 2500 and similar	31.05	12.35	
1002	Watson 2500 similar or larger	31.37	12.35	
	Crane (50 tons and under)			
1003	Arapahoe, Broomfield, Clear Creek, Elbert, Gilpin	31.70	12.35	
	Crane (51 - 90 tons)			
1004	Arapahoe, Broomfield, Clear Creek, Elbert, Gilpin	31.97	12.35	
	Crane (91 - 140 tons)			
1005	Arapahoe, Broomfield, Clear Creek, Elbert, Gilpin	33.05	12.35	
1006	**Scraper**			
1007	Single bowl under 40 cubic yards	31.20	12.35	
1008	40 cubic yards and over	31.37	12.35	

General Decision No. CO20220006

The wage and fringe benefits listed below do not reflect collectively bargained rates.

	CARPENTER:			
	Excludes Form Work			
1009	Adams	16.61	3.88	
1010	Arapahoe, Broomfield, Clear Creek, Elbert, Gilpin, Jefferson, Park	19.27	5.08	
	Form Work Only			
1011	Adams	16.78	3.57	
1012	Broomfield, Clear Creek, Elbert, Gilpin	19.11	5.46	
1013	Jefferson	16.88	3.81	
1014	Park	17.28	5.38	
	CEMENT MASON/CONCRETE FINISHER:			
1015	Adams	16.05	3.00	
1016	Arapahoe	18.70	3.85	
1017	Broomfield, Clear Creek, Elbert, Gilpin	18.37	3.00	
1018	Jefferson	18.02	3.42	
1019	Park	17.09	2.85	
	ELECTRICIAN:			
	Excludes Traffic Signal Installation			
1020	Adams	31.00	14.01	
1021	Arapahoe, Broomfield, Clear Creek, Elbert, Gilpin, Jefferson, Park	35.13	6.83	
	Traffic Signalization Electrician			
1022	Adams, Arapahoe, Broomfield, Clear Creek, Elbert, Gilpin, Park	27.25	7.10	
1023	Jefferson	26.78	5.44	
	Traffic Signalization Groundsman			
1024	Adams	13.96 **	2.80	**1**
1025	Arapahoe, Broomfield, Elbert, Gilpin, Park	15.24	3.81	
1026	Clear Creek	15.70	2.14	
1027	Jefferson	15.19	4.72	

General Decision No. CO20220006

The wage and fringe benefits listed below do not reflect collectively bargained rates.

Code	Classification	Basic Hourly Rate	Fringe Benefits	Last Mod
1028	**FENCE ERECTOR**	13.02 **	3.20	**1**
1029	**FORM WORKER** – Arapahoe	15.30	3.90	
	GUARDRAIL INSTALLER:			
1030	Adams	12.89 **	3.45	**1**
1031	Arapahoe, Broomfield, Clear Creek, Elbert, Gilpin, Jefferson, Park	12.89 **	3.20	**1**
	HIGHWAY/PARKING LOT STRIPING:			
	Painter			
1032	Adams, Arapahoe, Broomfield, Clear Creek, Elbert, Gilpin, Park	12.62 **	3.21	**1**
1033	Jefferson	14.21 **	3.21	**1**
	IRONWORKER:			
	Reinforcing			
1034	Adams	22.14	0.77	
1035	Arapahoe, Broomfield, Clear Creek, Elbert, Gilpin, Jefferson	16.69	5.45	
1036	Park	19.98	2.89	
1037	Structural	18.22	6.01	
	LABORER:			
	Asphalt Raker			
1038	Adams, Arapahoe, Broomfield, Clear Creek, Elbert, Gilpin, Jefferson	16.29	4.25	
1039	Park	17.41	1.86	
1040	Asphalt Shoveler	21.21	4.25	
1041	Asphalt Spreader	18.58	4.65	
	Common or General			
1042	Adams	16.29	4.25	
1043	Arapahoe, Broomfield, Clear Creek, Elbert, Gilpin	16.67	4.27	
1044	Jefferson	16.51	4.27	
1045	Park	15.64	2.46	

General Decision No. CO20220006

The wage and fringe benefits listed below do not reflect collectively bargained rates.

Code	Classification	Basic Hourly Rate	Fringe Benefits	Last Mod
	Concrete Saw (Hand Held)			
1046	Adams	16.29	5.20	
1047	Arapahoe, Broomfield, Clear Creek, Elbert, Gilpin, Jefferson, Park	16.29	6.14	
	Landscape and Irrigation			
1048	Adams, Arapahoe, Broomfield, Elbert, Gilpin, Jefferson, Park	12.26 **	3.16	**1**
1049	Clear Creek	14.98 **	3.16	**1**
	Mason Tender - Cement/Concrete			
1050	Adams	17.71	2.83	
1051	Arapahoe, Broomfield, Clear Creek, Elbert, Gilpin	16.96	4.04	
1052	Jefferson	16.29	4.25	
1053	Park	15.08	3.10	
1054	Pipelayer	13.55 **	2.41	**1**
	Traffic Control (Flagger)			
1055	Adams, Arapahoe, Broomfield, Clear Creek, Elbert, Gilpin	9.55 **	3.05	**1**
1056	Jefferson	9.73 **	3.05	**1**
1057	Park	9.42 **	3.21	**1**
	Traffic Control (Sets Up/Moves Barrels, Cones, Install Signs, Arrow Boards and Place Stationary Flags)			
1058	Adams, Arapahoe, Broomfield, Elbert, Gilpin, Jefferson	12.43 **	3.22	**1**
1059	Clear Creek	13.14 **	3.20	**1**
1060	Park	12.76 **	3.20	**1**
1061	**PAINTER (Spray Only)**	16.99	2.87	

General Decision No. CO20220006

The wage and fringe benefits listed below do not reflect collectively bargained rates.

Code	Classification	Basic Hourly Rate	Fringe Benefits	Last Mod
	POWER EQUIPMENT OPERATOR:			
	Asphalt Laydown			
1062	Adams, Arapahoe, Broomfield, Clear Creek, Elbert, Gilpin, Jefferson	22.67	8.75	
1063	Park	22.67	8.72	
1064	Asphalt Paver	24.97	6.13	
	Asphalt Roller			
1065	Adams	24.20	7.70	
1066	Arapahoe	22.68	8.72	
1067	Broomfield, Clear Creek, Elbert, Gilpin	23.41	7.67	
1068	Jefferson	22.84	7.69	
1069	Park	22.84	8.72	
	Asphalt Spreader			
1070	Adams, Arapahoe, Broomfield, Clear Creek, Elbert, Gilpin, Park	22.67	8.67	
1071	Jefferson	23.34	8.06	
	Backhoe/Trackhoe			
1073	Adams	20.31	4.24	
1074	Arapahoe	24.59	6.24	
1075	Broomfield, Clear Creek, Elbert, Gilpin	22.19	6.48	
1076	Jefferson	21.99	5.60	
1077	Park	20.81	6.58	

General Decision No. CO20220006

The wage and fringe benefits listed below do not reflect collectively bargained rates.

Code	Classification	Basic Hourly Rate	Fringe Benefits	Last Mod
	POWER EQUIPMENT OPERATOR (con't):			
	Bobcat/Skid Loader			
1078	Adams, Broomfield, Clear Creek, Elbert, Gilpin	15.37	4.28	
1079	Arapahoe	18.23	4.28	
1080	Jefferson	16.85	4.28	
1081	Park	22.46	0.00	
1082	Boom	22.67	8.72	
	Broom/Sweeper			
1083	Adams, Broomfield, Clear Creek, Elbert, Gilpin, Park	22.70	8.07	
1084	Arapahoe	22.67	8.73	
1085	Jefferson	22.18	8.36	
	Bulldozer			
1086	Adams	25.20	6.72	
1087	Arapahoe, Broomfield, Clear Creek, Elbert, Gilpin, Jefferson, Park	26.90	5.59	
1088	Concrete Pump	21.60	5.21	
	Crane			
1089	Adams, Park	22.82	8.72	
1090	Jefferson	23.55	6.68	
	Drill			
1091	Adams, Arapahoe, Broomfield, Clear Creek, Elbert, Gilpin, Park	20.48	4.71	
1092	Jefferson	20.65	5.74	
1093	Forklift	15.91	4.68	

General Decision No. CO20220006

The wage and fringe benefits listed below do not reflect collectively bargained rates.

Code	Classification	Basic Hourly Rate	Fringe Benefits	Last Mod
	POWER EQUIPMENT OPERATOR (con't):			
	Grader/Blade			
1094	Adams	23.94	8.23	
1095	Arapahoe	22.67	8.72	
1096	Broomfield, Clear Creek, Elbert, Gilpin, Park	23.90	7.93	
1097	Jefferson	23.28	7.73	
1098	Guardrail/Post Driver	16.07	4.41	
	Loader (Front End)			
1099	Adams	23.09	8.72	
1100	Arapahoe	26.80	4.84	
1101	Broomfield, Clear Creek, Elbert, Gilpin	23.20	8.33	
1102	Jefferson	23.06	7.76	
1103	Park	22.67	8.72	
	Mechanic			
1104	Adams	22.82	8.72	
1105	Arapahoe, Broomfield, Clear Creek, Elbert, Gilpin, Park	24.04	7.35	
1106	Jefferson	23.56	8.72	
	Oiler			
1107	Adams, Jefferson	21.97	8.72	
1108	Arapahoe, Broomfield, Clear Creek, Elbert, Gilpin, Park	23.73	8.41	
	Roller/Compactor (Dirt and Grade Compaction)			
1109	Adams	16.70	3.30	
1110	Arapahoe, Broomfield, Clear Creek, Elbert, Gilpin, Jefferson	20.30	5.51	
1111	Park	16.52	3.13	
1112	Rotomill	16.22	4.41	

General Decision No. CO20220006

The wage and fringe benefits listed below do not reflect collectively bargained rates.

Code	Classification	Basic Hourly Rate	Fringe Benefits	Last Mod
	POWER EQUIPMENT OPERATOR (con't):			
	Screed			
1113	Adams	27.89	3.50	
1114	Arapahoe	22.67	8.72	
1115	Broomfield, Clear Creek, Elbert, Gilpin	24.67	6.02	
1116	Jefferson	22.64	8.43	
1117	Park	20.36	3.04	
1118	Tractor	13.13 **	2.95	**1**
	TRUCK DRIVER:			
	Distributor			
1119	Adams	15.80	5.27	
1120	Arapahoe	19.62	5.27	
1812	Broomfield, Clear Creek, Elbert, Gilpin, Park	18.19	5.27	
1121	Jefferson	19.46	6.04	
	Dump Truck			
1122	Adams	16.68	5.27	
1123	Arapahoe	18.94	5.27	
1124	Broomfield, Clear Creek, Elbert, Gilpin	16.47	5.27	
1125	Jefferson	16.97	4.78	
1126	Park	15.40	3.21	
	Lowboy Truck			
1127	Adams, Arapahoe, Broomfield, Clear Creek, Elbert, Gilpin, Park	17.25	5.27	
1128	Jefferson	19.80	6.42	
1129	Mechanic	26.48	3.50	
	Multi-Purpose Speciality and Hoisting Truck			
1130	Adams, Broomfield, Clear Creek, Elbert, Gilpin, Park	17.49	3.17	
1131	Arapahoe	15.79	2.48	
1132	Jefferson	15.13	3.89	

General Decision No. CO20220006

The wage and fringe benefits listed below do not reflect collectively bargained rates.

Code	Classification	Basic Hourly Rate	Fringe Benefits	Last Mod
	TRUCK DRIVER (con't.):			
	Semi/Trailer Truck (Includes Pickup and Pilot Car)			
1133	Adams, Broomfield, Clear Creek, Elbert, Gilpin, Jefferson, Park	18.39	4.13	
1134	Arapahoe	16.00	2.60	
	Single Axle (Includes Pickup and Pilot Car)			
1135	Adams, Jefferson	13.93 **	3.68	**1**
1136	Arapahoe	15.10	3.77	
1137	Broomfield, Clear Creek, Elbert, Gilpin, Park	14.74 **	3.68	**1**
1138	Truck Mounted Attenuator	12.43 **	3.22	**1**
	Water Truck			
1139	Adams	17.50	5.19	
1140	Arapahoe, Broomfield, Clear Creek, Elbert, Gilpin, Park	19.36	4.07	
1141	Jefferson	17.57	5.27	

WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.

Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29 CFR 5.5(a)(1)(ii)).

In the listing above, the "SU" designation means that rates listed under the identifier do not reflect collectively bargained wage and fringe benefit rates. Other designations indicate unions whose rates have been determined to be prevailing.

MINIMUM WAGE RATES

Note: Contracts subject to the Davis-Bacon Act are generally required to pay at least the applicable minimum wage rate required under Executive Order 14026 or Executive Order 13658. Please note that these Executive Orders apply to covered contracts entered into by the federal government that are subject to the Davis-Bacon Act itself, but do not apply to contracts subject only to the Davis-Bacon Related Acts, including those set forth at 29 CFR 5.1(a)(2)-(60).	
If the contract is entered into on or after January 30, 2022, or the contract is contract is renewed or extended (e.g., an option is exercised) on or after January 30, 2022:	Executive Order 14026 generally applies to the contract. The contractor must pay all covered workers at least $15.00 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on the contract in 2022.
If the contract was awarded on or between January 1, 2015 and January 29, 2022, and the contract is not renewed or extended on or after January 30, 2022:	Executive Order 13658 generally applies to the contract. The contractor must pay all covered workers at least $11.25 per hour (or applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on that contract in 2022.
The applicable Executive Order minimum wage rate will be adjusted annually. If this contract is covered by one of the Executive Orders and a classification considered necessary for performance of work on the contract does not appear on this wage determination, the contractor must still submit a conformance request.	
**** Workers in this classification may be entitled to a higher minimum wage under Executive Order 14026 ($15.00) or 13658 ($11.25). Please see the Note at the top of this table for more information.**	
For further information, please click on this link: https://www.dol.gov/agencies/whd/government-contracts/eo14026	

WAGE DETERMINATION APPEALS PROCESS

1.) Has there been an initial decision in the matter? This can be:
* an existing published wage determination
* a survey underlying a wage determination
* a Wage and Hour Division letter setting forth a position on a wage determination matter
* a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests for summaries of surveys, should be with the Wage and Hour Regional Office for the area in which the survey was conducted because those Regional Offices have responsibility for the Davis-Bacon survey program.
If the response from this initial contact is not satisfactory, then the process described in
2.) and 3.) should be followed.

With regard to any other matter not yet ripe for the formal process described here, initial contact should be with the Branch of Construction Wage Determinations. Write to:

Branch of Construction Wage Determinations
Wage and Hour Division
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

2.) If the answer to the question in 1.) is yes, then an interested party (those affected by the action) can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7).
Write to:

Wage and Hour Administrator
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and by any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3.) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

4.) All decisions by the Administrative Review Board are final.

END OF GENERAL DECISION NO. CO20220006

October 1, 2021

ON THE JOB TRAINING

NOTICE

This is a standard special provision that revises or modifies CDOT's *Standard Specifications for Road and Bridge Construction*. It has gone through a formal review and approval process and has been issued by CDOT's Project Development Branch with formal instructions regarding its use on CDOT construction projects. It is to be used as written without change. Do not use modified versions of this special provision on CDOT construction projects, and do not use this special provision on CDOT projects in a manner other than that specified in the instructions unless such use is first approved by the Standards and Specifications Unit of the Project Development Branch. The instructions for use on CDOT construction projects appear below.

Other agencies that use the *Standard Specifications for Road and Bridge Construction* to administer construction projects may use this special provision as appropriate and at their own risk.

INSTRUCTIONS FOR USE ON CDOT CONSTRUCTION PROJECTS:

Use this standard special provision on all Federal-aid projects, including local agency projects, except for local agency projects where the local agency will not use LCPtracker for reporting.

ON THE JOB TRAINING

This On-the-Job Training (OJT) special provision is an implementation of 23 U.S.C, 140(a), a federal requirement to provide equal opportunity and training on federal-aid construction projects. The Contractor shall meet the requirements of the FHWA 1273 for all apprentices and trainees. For additional guidance, please look at the OJT Contractor Manual.

1. Goal Setting

CDOT will set OJT goals for every federally-assisted project. Goals for the projects will be set based on the criteria that is outlined in the 23 CFR Part 230, Appendix B to Subpart (A):

A. Availability of minorities, women, and disadvantaged persons for training;

B. The potential for effective training;

C. Duration of the contract;

D. Dollar value of the contract;

E. Total normal workforce that the average bidder could be expected to use;

F. Geographic location;

G. Type of work;

H. The need for journey-level workers in the area;

I. Recognition of the state's goal;

J. A satisfactory ratio of trainees to journeymen expected to be on the workforce.

The number of required training hours will be identified in the Contract. The following chart provides guidelines based on contract value, but the required number of hours will be determined by CDOT after consideration of the aforementioned variables.

Contract dollar value	Training hours to be provided on the project
Up to 1 million	0
>1 - 2 million	320
>2 - 4 million	640
>4 - 6 million	1280
>6 - 8 million	1600
>8 - 12 million	1920
>12 - 16 million	2240
>16 - 20 million	2560
For each increment of $5 million, over $20 million	1280

2. Training Plan Options

CDOT accepts the following training programs:

A. CDOT's pre-approved classifications utilization program (PAC-UP);

B. A registered U.S. Department of Labor training program or apprenticeship program;

C. Approved programs through workforce centers and through specific groups like Colorado Contractors Association (CCA) and Western Colorado Contractors Association (WCCA);

D. A Contractor specific plan approved by CDOT and the Federal Highway Administration (FHWA).

The minimum length and type of training for each skilled craft shall be as established in the training program selected by the Contractor.

When one or more approved plans are chosen, the Contractor shall submit the OJT Contractor Commitment to Meet OJT Requirements, CDOT Form 1337 to the Engineer. Additional pre-approved training programs and/or additional apprentices/trainees may be utilized at any point throughout the project. The plan option(s) that the Contractor chooses will be effective for the duration of the project.

3. Journey-Level Worker to Apprentice/Trainee Ratio

The OJT goal requirement shall be met through approved trainee(s)/apprentice(s) working on the CDOT project under the supervision of a journey-level worker. For the CDOT Pre-Approved Classification Training Programs (PAC-UP), the apprentice/trainee ratio to journey-level worker shall not exceed a one to one ratio for all classifications, and the Contractor shall not exceed 25 percent of the workforce as trainees/apprentices at any time. Furthermore, it is at CDOT's discretion that a stricter ratio guideline may be imposed as outlined in the specific training classification. For all other approved programs, the apprentice/trainee ratio shall be as outlined in the specific program. When apprentices/trainees are on the job without proper supervision as outlined above, they shall be paid full Davis-Bacon wages.

4. Trainee Selection

Two components must be considered when choosing a trainee:

A. The intent of this program is for Contractors to recruit and train entry-level individuals or individuals who will be working within new classifications and guide them toward journey-level status in that specific classification. A trainee will not be approved in any classification for which they have already obtained journey-level status.

B. Another intent of the OJT program is the primary consideration for the Contractor to use minorities, women, and disadvantaged persons to fulfill the trainee roles, and as such, the Contractor shall make every effort to enroll such individuals in the program by using "systematic and direct recruitment through public and private sources."

The consideration to include women and minorities is based on the regulation; however, it will not be used to systematically deny any one person or group from the opportunity to be a part of the OJT program. CDOT may reject non-minority male trainees for entry into the program if it is determined that a Contractor failed to make sufficient good faith efforts (GFE) to hire minorities or female trainees and/or the Contractor failed to document or submit evidence of its GFE to do so. CDOT will consider a Contractor's documentation of all GFE on a case-by-case basis and will take into account the items listed in the goal setting section of this specification. For more information, please see Section 11 of this specification.

5. OJT Apprentice/Trainee Approval

As a condition of the OJT program, the Contractor will:

A. Notify all employees at the start of employment and at a minimum of at least once per year regarding the available training programs, positions, and eligibility requirements. The Contractor shall document that this information was conveyed to and received by employees.

B. Provide each trainee with a copy of his or her enrollment form (if applicable) and the training program within a month of starting the chosen plan.

The OJT submittals (CDOT Form 1337, Contractor Commitment to Meet OJT Requirements; CDOT Form 832, Trainee Status and Evaluation; CDOT Form 838, OJT apprentice/trainee Record) shall be filled out completely and approved or rejected by CDOT. If the apprentice/trainee is working within the proposed classification before approval is granted, full Davis-Bacon prevailing wages shall be paid to the individual.

The Regional Civil Rights Office must approve the CDOT Form 838 prior to any of the hours counting toward the OJT goal. If there is a CDOT delay that is completely outside of the Contractor's responsibility for approval of the apprentices/trainees, and if approval is ultimately granted, the date that will be utilized will be ten business days after the date that the CDOT Form 838 was submitted.

The Contractor shall retain full responsibility for meeting the training requirements imposed by this special provision.

6. Eligible Work Activities that Count Toward the Training Goal

The work hours that are completed on the site of work and per the training documents for approved apprentices/trainees in approved classifications and programs will apply toward the project goal. Hours for work performed outside the individual's approved training classification will not count toward the project OJT goal and the individual shall be paid full applicable prevailing wage.

Job shadowing can apply toward the project goal if it is written into the specific training plan. If the Contractor is using CDOT's PAC-UP training program, job shadowing can apply toward the project goal when the approved employee is performing within the "Observation" component of the plan (hours vary by classification). Non-CDOT project hours will not be accepted toward the project goal.

Although US DOL apprenticeship programs can use the reduced wages for any CDOT job (with or without an OJT goal) with approval, none of these "additional" hours may be banked or included for use as part of the required special provisions on any project other than that for which it was approved.

The Contractor may count OJT hours accomplished by a subcontractor with an approved plan. The subcontractor's trainee or apprentice, who is enrolled in any of the approved OJT programs and is contributing toward meeting a project's OJT goal hours, can count toward the project's OJT goal to satisfy the requirement of this specification. A subcontractor who chooses to participate in meeting the OJT goal shall follow the same process as the Contractor in terms of approving apprentices/trainees, submitting forms, etc. The Contractor retains the full responsibility for meeting the training requirements imposed by this special provision.

7. Contractor Training and Trainee Monitoring

The Contractor's representative (supervisor, manager, or other designee) will evaluate progress for the apprentice/trainee monthly and will provide a copy to the apprentice/trainee of the submitted CDOT Form 832 within 30 calendar days. This evaluation will include documentation of the apprentice/trainee's performance including what was done well and what needs to be improved. The Contractor training and monitoring will be evaluated through CDOT's use of the CDOT Form 200 Interview.

8. Wages

The Contractor may pay apprentice/trainee wages at a reduced rate for those that are in an approved program according to the following guidelines:

US DOL Apprenticeship Programs

Rates (at minimum) will be paid according to the scaled adjustments for a registered US DOL Apprentice. Fringe benefits (either in cash and/or bona fide benefits in lieu of cash) will be paid in full and as outlined by the bargained agreement. If fringe benefits are not mentioned as part of a bargained agreement or if there is no collectively bargained agreement, full fringe benefits will be paid as outlined through the US DOL wage decision. Approved US DOL apprenticeship programs can use the reduced wages for any CDOT project.

If the project does not have a training goal and the Contractor is seeking to pay apprenticeship rates as part of a registered US DOL Apprenticeship Program, the following documentation is required to ensure wages are being paid correctly: apprenticeship program registration, OA (formerly BAT) certificates, and collective bargaining agreement including the wage sheet.

Other Approved Programs

For all other OJT wage reductions, reduced percentages are allowed for the project if there is a goal greater than zero as outlined in the 23 CFR Appendix B to Subpart A of Part 230 (as described in this section), in the collectively bargained agreement, or as outlined in the specific plans. If the Contractor chooses to pay the trainee rates, the reduced percentage shall be based only on the base rate of pay. Fringe benefits shall be paid at 100 percent of the journey-level wage. If the apprentice/trainee is working within the proposed classification before approval is granted, full Davis-Bacon prevailing wages shall be paid to the apprentice/trainee.

The minimum trainee wage (base and fringe) shall be no less than $13.00 per hour. Trainees shall be paid at minimum:

First half of the training period -- at least 60 percent of the appropriate minimum journey-level rate

Third quarter of the training period – at least 75 percent of the appropriate minimum journey-level rate

Last quarter of the training period -- at least 90 percent of the appropriate minimum journey-level rate

9. Contractor Reporting

The Contractor shall keep all data associated with the trainees and the project for a period of at least three years from the closing date of the Contract.

10. Reimbursement to Contractors

For the purposes of reimbursement, the Contractor will have satisfied its responsibilities under this specification if CDOT has determined that it has fulfilled the acceptable number of training hours. Contractors will be reimbursed at a rate of $10.00 per hour per (approved) trainee for all OJT hours worked in approved classifications up to the project goal.

The Contractor will be reimbursed for no more than the amount outlined in the OJT Force Account budget.

11. OJT Good Faith Efforts (GFE)

CDOT recognizes two explanations of good faith efforts: (1) The Contractor will be required to prove an effort has been made to achieve a diversified workforce, but it has not yet been accomplished, or (2) The attempt has been made to meet the number of required OJT hours by using approved trainees or apprentices in approved classification(s) utilizing approved plans, but the Contractor cannot meet the required number of hours. In either case, a GFE will be required, and the Region Civil Rights Office will make the determination.

A. If the Contractor does not meet its OJT project goal with the inclusion of some female and/or minority trainees, the Contractor may be requested to produce documentation of adequate good faith efforts taken to fill that position with a minority or female applicant. Good faith efforts are designed to achieve equal opportunity through positive, assertive, and continuous result-oriented measures. Good faith efforts should be taken as hiring opportunities arise.

B. If the Contractor does not meet its OJT project goal, the Contractor may submit a CDOT Form 1336, Waiver Request for Contract's OJT Hours. On the form, the Contractor shall outline and submit all good faith efforts made when it is believed that the required number of training hours will not be met. If GFE is not demonstrated and approved, The Contractor will be subject to payment reductions outlined in the Disincentive Section.

If a good faith effort has been denied by CDOT, the Contractor may ask for reconsideration by the Region Civil Rights Manager and the Resident Engineer for the region where work is being performed. Additionally, if requested by the Contractor, the Region Civil Rights Office and the Project Engineer will meet with the Contractor to discuss the Contractor's initial Good Faith Effort determination.

12. Disincentive

A failure to provide the required training without the demonstration and approval of GFE to meet the project OJT goal may result in the Region Civil Rights Office assigning the following disincentive: A sum representing the total number of hours not met in the contract shall be multiplied by the journey worker hourly wages plus fringe benefits [(hours not met) x (dollar per hour + fringe benefits) = disincentive amount].

In order to obtain the disincentive amount, the journey worker wages will be figured using the prevailing wages for the classifications outlined on the CDOT Form 1337. If a single classification is noted on the submitted CDOT Form 1337, then that one wage will be used to figure the monetary amount owed. If multiple classifications are used, then the journey worker wages of all classifications will be used to determine an average wage rate. If the Contractor does not submit any documentation toward the OJT goal, the disincentive rate will be calculated at $30.00 per hour. CDOT will provide the Contractor a written notice at the final acceptance stage of the project informing them of the noncompliance with this specification which will include a calculation of the disincentive(s) to be assessed.

October 1, 2021

PROJECT FIRST PROGRAM

NOTICE

This is a standard special provision that revises or modifies CDOT's *Standard Specifications for Road and Bridge Construction*. It has gone through a formal review and approval process and has been issued by CDOT's Project Development Branch with formal instructions for its use on CDOT construction projects. It is to be used as written without change. Do not use modified versions of this special provision on CDOT construction projects, and do not use this special provision on CDOT projects in a manner other than that specified in the instructions unless such use is first approved by the Standards and Specifications Unit of the Project Development Branch. The instructions for use on CDOT construction projects appear below.

Other agencies which use the *Standard Specifications for Road and Bridge Construction* to administer construction projects may use this special provision as appropriate and at their own risk.

Instructions for use on CDOT construction projects:

Use on all projects with an Engineer's Estimate over $1 Million. It is optional for smaller projects.

1
PROJECT FIRST PROGRAM

Project First is a requirement for this project.

The Project First Program is structured to draw on the strengths of each organization, CDOT and Contractor, to identify and achieve mutual goals. The objective is scalable, effective, and efficient contract performance with reciprocal cooperation and completion within budget, on schedule, and in accordance with the Contract. The CDOT Project Engineer and the Superintendent are the lead representatives to ensure staff from both organizations address the issues that need to be addressed in a timely manner, at the appropriate levels to keep the project moving. Executive management from both organizations are encouraged to visit with the project teams when available.

An Initial Workshop shall be held prior to the Preconstruction Conference.

The following CDOT personnel will attend the Initial Workshop: CDOT RTD or designated representative, CDOT's Resident Engineer, Project Engineer, other key project personnel.

The following Contractor personnel shall attend the Initial Workshop: Owner or Executive or designated representative, Superintendent, key prime project supervision personnel, key subcontractors.

The following personnel shall also be invited to attend, as determined jointly by the Project Engineer and Superintendent: project design engineer, key local government personnel, suppliers, design consultants, CDOT maintenance foreman, CDOT environmental manager, key railroad personnel, key utility personnel.

Follow-up workshops shall be held periodically throughout the duration of the Contract as agreed to by the Contractor and the Engineer at the Initial Workshop, but shall be no less frequent than every other month for projects lasting longer than six months. For projects with a duration of less than six months, the minimum number of workshops shall be the initial workshop, one interim workshop, and a final closeout workshop. For the purposes of this specification, duration shall mean the number of working months initially planned to start and complete the work. Workshops are not required during landscape establishment periods.

The personnel listed as attending the Initial Workshop are required to attend the follow-up workshops with the exception of the RTD and Prime Owner or Executive, or their designated representatives and key subcontractors whose work is completed. CDOT will schedule the workshops. The CDOT Project Engineer and Contractor Superintendent will jointly agree on the list of persons to be invited to the Initial Workshop and follow-up workshops and will invite the members from their respective teams.

The establishment of a Project First charter is optional. The charter shall not change the legal relationship of the parties to the Contract or act as a waiver of or supersede terms of the Contract. If a charter is developed, it shall be developed at the Initial Workshop.

The Initial Workshop agenda shall at a minimum cover the following items:

(1) Development of charter (optional as described above)

(2) Presentation by the Contractor of the planned approach to building the project

(3) Presentation by CDOT of the planned approach to administer the project

(4) Development of a list of risks to each party along with a probability and severity associated with each risk

(5) Discussion and generation of possible solutions to manage and mitigate the risks. Each party shall provide input regarding the risks associated with the other party.

(6) Development of an escalation ladder. This ladder shall be used to escalate major or repeated performance concerns up the supervisory chain. The ladder shall be two lists, one for escalation within the Prime company organization and one for escalation within the CDOT organization. The escalation ladder shall be employed when the following types of concerns arise:

A. Bad faith

B. Administration performance: When any party is not responsive in administrative performance such as resolving requests for information, developing partial payments, submitting required documentation, delays in progressing issues, and in negotiation of prices.

C. Where either party's project staff refuses to follow or repeatedly does not follow important Contract requirements or the direction of the Engineer

D. Where either party's project staff appear unable or not competent in performing construction administration duties

E. Professionalism: When either party is acting in an unprofessional manner. This includes being disrespectful, vulgar, or exhibiting aggressive behavior.

Although these types of issues may contribute to those as described in subsection 105.22, they are a different type of issue. Subsection 105.22 is the only Contract escalation ladder for all issues related to quantum and Contract time.

(7) Development of an Issue Documentation Matrix. This document shall be used to track large or potentially large issues which arise during construction. This document shall at a minimum do the following:

A. List and describe the issue.

B. Track the progress towards resolution of the issue by tracking which party has the actionable item and the dates the actions were completed.

(8) Determination and agreement as to which party will administer to (update) each Project First tool.

Tools to assist with Project First can be found on CDOT's website at:
https://www.codot.gov/business/designsupport/projectfirst.

All costs related to Project First are incidental with the exception of the actual billing of any third party used for formal meeting facilitation. The cost for a meeting facilitator will be split evenly between the parties and shall be agreed upon before utilization of the third party. Either CDOT or the Contractor can contract directly with the third party. CDOT will set up a Force Account item in the project (if necessary) to pay for CDOT's share of meeting facilitation costs.

This specification does not take precedent over any other Contract requirement.

June 18, 2021

REQUIRED CONTRACT PROVISIONS
FEDERAL-AID CONSTRUCTION CONTRACTS

NOTICE

This is a standard special provision that revises or modifies CDOT's *Standard Specifications for Road and Bridge Construction*. It has gone through a formal review and approval process and has been issued by CDOT's Project Development Branch with formal instructions for its use on CDOT construction projects. It is to be used as written without change. Do not use modified versions of this special provision on CDOT construction projects, and do not use this special provision on CDOT projects in a manner other than that specified in the instructions unless such use is first approved by the Standards and Specifications Unit of the Project Development Branch. The instructions for use on CDOT construction projects appear below.

Other agencies which use the *Standard Specifications for Road and Bridge Construction* to administer construction projects may use this special provision as appropriate and at their own risk.

Instructions for use on CDOT construction projects:

Use this standard special provision all on federal-aid construction projects.

REQUIRED CONTRACT PROVISIONS
FEDERAL-AID CONSTRUCTION CONTRACTS

Attached is Form FHWA 1273 titled *Required Contract Provisions Federal-Aid Construction Contracts*. As described in Section I. General, the provisions of Form FHWA 1273 apply to all work performed under the Contract and are to be included in all subcontracts with the following modification:

For TAP (Transportation Alternatives Program) funded Recreational Trails projects, Section I (4) regarding convict labor and all of Section IV of the FHWA 1273 do not apply.

FHWA-1273 -- Revised May 1, 2012

REQUIRED CONTRACT PROVISIONS
FEDERAL-AID CONSTRUCTION CONTRACTS

I. General
II. Nondiscrimination
III. Nonsegregated Facilities
IV. Davis-Bacon and Related Act Provisions
V. Contract Work Hours and Safety Standards Act Provisions
VI. Subletting or Assigning the Contract
VII. Safety: Accident Prevention
VIII. False Statements Concerning Highway Projects
IX. Implementation of Clean Air Act and Federal Water Pollution Control Act
X. Compliance with Governmentwide Suspension and Debarment Requirements
XI. Certification Regarding Use of Contract Funds for Lobbying

ATTACHMENTS

A. Employment and Materials Preference for Appalachian Development Highway System or Appalachian Local Access Road Contracts (included in Appalachian contracts only)

I. GENERAL

1. Form FHWA-1273 must be physically incorporated in each construction contract funded under Title 23 (excluding emergency contracts solely intended for debris removal). The contractor (or subcontractor) must insert this form in each subcontract and further require its inclusion in all lower tier subcontracts (excluding purchase orders, rental agreements and other agreements for supplies or services).

The applicable requirements of Form FHWA-1273 are incorporated by reference for work done under any purchase order, rental agreement or agreement for other services. The prime contractor shall be responsible for compliance by any subcontractor, lower-tier subcontractor or service provider.

Form FHWA-1273 must be included in all Federal-aid design-build contracts, in all subcontracts and in lower tier subcontracts (excluding subcontracts for design services, purchase orders, rental agreements and other agreements for supplies or services). The design-builder shall be responsible for compliance by any subcontractor, lower-tier subcontractor or service provider.

Contracting agencies may reference Form FHWA-1273 in bid proposal or request for proposal documents, however, the Form FHWA-1273 must be physically incorporated (not referenced) in all contracts, subcontracts and lower-tier subcontracts (excluding purchase orders, rental agreements and other agreements for supplies or services related to a construction contract).

2. Subject to the applicability criteria noted in the following sections, these contract provisions shall apply to all work performed on the contract by the contractor's own organization and with the assistance of workers under the contractor's immediate superintendence and to all work performed on the contract by piecework, station work, or by subcontract.

3. A breach of any of the stipulations contained in these Required Contract Provisions may be sufficient grounds for withholding of progress payments, withholding of final payment, termination of the contract, suspension / debarment or any other action determined to be appropriate by the contracting agency and FHWA.

4. Selection of Labor: During the performance of this contract, the contractor shall not use convict labor for any purpose within the limits of a construction project on a Federal-aid highway unless it is labor performed by convicts who are on parole, supervised release, or probation. The term Federal-aid highway does not include roadways functionally classified as local roads or rural minor collectors.

II. NONDISCRIMINATION

The provisions of this section related to 23 CFR Part 230 are applicable to all Federal-aid construction contracts and to all related construction subcontracts of $10,000 or more. The provisions of 23 CFR Part 230 are not applicable to material supply, engineering, or architectural service contracts.

In addition, the contractor and all subcontractors must comply with the following policies: Executive Order 11246, 41 CFR 60, 29 CFR 1625-1627, Title 23 USC Section 140, the Rehabilitation Act of 1973, as amended (29 USC 794), Title VI of the Civil Rights Act of 1964, as amended, and related regulations including 49 CFR Parts 21, 26 and 27; and 23 CFR Parts 200, 230, and 633.

The contractor and all subcontractors must comply with: the requirements of the Equal Opportunity Clause in 41 CFR 60-1.4(b) and, for all construction contracts exceeding $10,000, the Standard Federal Equal Employment Opportunity Construction Contract Specifications in 41 CFR 60-4.3.

Note: The U.S. Department of Labor has exclusive authority to determine compliance with Executive Order 11246 and the policies of the Secretary of Labor including 41 CFR 60, and 29 CFR 1625-1627. The contracting agency and the FHWA have the authority and the responsibility to ensure compliance with Title 23 USC Section 140, the Rehabilitation Act of 1973, as amended (29 USC 794), and Title VI of the Civil Rights Act of 1964, as amended, and related regulations including 49 CFR Parts 21, 26 and 27; and 23 CFR Parts 200, 230, and 633.

The following provision is adopted from 23 CFR 230, Appendix A, with appropriate revisions to conform to the U.S. Department of Labor (US DOL) and FHWA requirements.

1. Equal Employment Opportunity: Equal employment opportunity (EEO) requirements not to discriminate and to take affirmative action to assure equal opportunity as set forth under laws, executive orders, rules, regulations (28 CFR 35, 29 CFR 1630, 29 CFR 1625-1627, 41 CFR 60 and 49 CFR 27) and orders of the Secretary of Labor as modified by the

provisions prescribed herein, and imposed pursuant to 23 U.S.C. 140 shall constitute the EEO and specific affirmative action standards for the contractor's project activities under this contract. The provisions of the Americans with Disabilities Act of 1990 (42 U.S.C. 12101 et seq.) set forth under 28 CFR 35 and 29 CFR 1630 are incorporated by reference in this contract. In the execution of this contract, the contractor agrees to comply with the following minimum specific requirement activities of EEO:

a. The contractor will work with the contracting agency and the Federal Government to ensure that it has made every good faith effort to provide equal opportunity with respect to all of its terms and conditions of employment and in their review of activities under the contract.

b. The contractor will accept as its operating policy the following statement:

"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, national origin, age or disability. 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, pre-apprenticeship, and/or on-the-job training."

2. EEO Officer: The contractor will designate and make known to the contracting officers an EEO Officer who will have the responsibility for and must be capable of effectively administering and promoting an active EEO program and who must be assigned adequate authority and responsibility to do so.

3. Dissemination of Policy: 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 EEO policy and contractual responsibilities to provide EEO 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:

a. 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 EEO policy and its implementation will be reviewed and explained. The meetings will be conducted by the EEO Officer.

b. All new supervisory or personnel office employees will be given a thorough indoctrination by the EEO Officer, covering all major aspects of the contractor's EEO obligations within thirty days following their reporting for duty with the contractor.

c. All personnel who are engaged in direct recruitment for the project will be instructed by the EEO Officer in the contractor's procedures for locating and hiring minorities and women.

d. Notices and posters setting forth the contractor's EEO policy will be placed in areas readily accessible to employees, applicants for employment and potential employees.

e. The contractor's EEO 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.

4. Recruitment: When advertising for employees, the contractor will include in all advertisements for employees the notation: "An Equal Opportunity Employer." All such advertisements will be placed in publications having a large circulation among minorities and women in the area from which the project work force would normally be derived.

a. 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 minorities and women. To meet this requirement, the contractor will identify sources of potential minority group employees, and establish with such identified sources procedures whereby minority and women applicants may be referred to the contractor for employment consideration.

b. In the event the contractor has a valid bargaining agreement providing for exclusive hiring hall referrals, the contractor is expected to observe the provisions of that agreement to the extent that the system meets the contractor's compliance with EEO contract provisions. Where implementation of such an agreement has the effect of discriminating against minorities or women, or obligates the contractor to do the same, such implementation violates Federal nondiscrimination provisions.

c. The contractor will encourage its present employees to refer minorities and women as applicants for employment. Information and procedures with regard to referring such applicants will be discussed with employees.

5. 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, national origin, age or disability. 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 contractor will promptly investigate all complaints of alleged discrimination made to the contractor in connection with its 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 their avenues of appeal.

6. Training and Promotion:

a. The contractor will assist in locating, qualifying, and increasing the skills of minorities and women who are applicants for employment or current employees. Such efforts should be aimed at developing full journey level status employees in the type of trade or job classification involved.

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. In the event a special provision for training is provided under this contract, this subparagraph will be superseded as indicated in the special provision. The contracting agency may reserve training positions for persons who receive welfare assistance in accordance with 23 U.S.C. 140(a).

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 employees who are minorities and women and will encourage eligible employees to apply for such training and promotion.

7. Unions: If the contractor relies in whole or in part upon unions as a source of employees, the contractor will use good faith efforts to obtain the cooperation of such unions to increase opportunities for minorities and women. Actions by the contractor, either directly or through a contractor's association acting as agent, will include the procedures set forth below:

a. The contractor will use good faith efforts to develop, in cooperation with the unions, joint training programs aimed toward qualifying more minorities and women for membership in the unions and increasing the skills of minorities and women so that they may qualify for higher paying employment.

b. The contractor will use good faith efforts to incorporate an EEO 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, national origin, age or disability.

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 contracting agency 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 referrals within the 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, national origin, age or disability; making full efforts to obtain qualified and/or qualifiable minorities and women. The failure of a union to provide sufficient referrals (even though it is obligated to provide exclusive referrals under the terms of a collective bargaining agreement) does not relieve the contractor from the requirements of this paragraph. 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 contracting agency.

8. Reasonable Accommodation for Applicants / Employees with Disabilities: The contractor must be familiar with the requirements for and comply with the Americans with Disabilities Act and all rules and regulations established there under. Employers must provide reasonable accommodation in all employment activities unless to do so would cause an undue hardship.

9. Selection of Subcontractors, Procurement of Materials and Leasing of Equipment: The contractor shall not discriminate on the grounds of race, color, religion, sex, national origin, age or disability in the selection and retention of subcontractors, including procurement of materials and leases of equipment. The contractor shall take all necessary and reasonable steps to ensure nondiscrimination in the administration of this contract.

a. The contractor shall notify all potential subcontractors and suppliers and lessors of their EEO obligations under this contract.

b. The contractor will use good faith efforts to ensure subcontractor compliance with their EEO obligations.

10. Assurance Required by 49 CFR 26.13(b):

a. The requirements of 49 CFR Part 26 and the State DOT's U.S. DOT-approved DBE program are incorporated by reference.

b. The contractor or subcontractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. The contractor shall carry out applicable requirements of 49 CFR Part 26 in the award and administration of DOT-assisted contracts. Failure by the contractor to carry out these requirements is a material breach of this contract, which may result in the termination of this contract or such other remedy as the contracting agency deems appropriate.

11. Records and Reports: The contractor shall keep such records as necessary to document compliance with the EEO requirements. Such records shall be retained for a period of three years following the date of the final payment to the contractor for all contract work and shall be available at reasonable times and places for inspection by authorized representatives of the contracting agency and the FHWA.

a. The records kept by the contractor shall document the following:

(1) The number and work hours of minority and non-minority group members and women employed in each work classification on the project;

(2) The progress and efforts being made in cooperation with unions, when applicable, to increase employment opportunities for minorities and women; and

(3) The progress and efforts being made in locating, hiring, training, qualifying, and upgrading minorities and women;

b. The contractors and subcontractors will submit an annual report to the contracting 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 FHWA-1391. The staffing data should represent the project work force on board in all or any part of the last payroll period preceding the end of July. If on-the-job training is being required by special provision, the contractor will be required to collect and report training data. The employment data should reflect the work force on board during all or any part of the last payroll period preceding the end of July.

III. NONSEGREGATED FACILITIES

This provision is applicable to all Federal-aid construction contracts and to all related construction subcontracts of $10,000 or more.

The contractor must ensure that facilities provided for employees are provided in such a manner that segregation on the basis of race, color, religion, sex, or national origin cannot result. The contractor may neither require such segregated use by written or oral policies nor tolerate such use by employee custom. The contractor's obligation extends further to ensure that its employees are not assigned to perform their services at any location, under the contractor's control, where the facilities are segregated. The term "facilities" includes waiting rooms, work areas, restaurants and other eating areas, time clocks, restrooms, washrooms, locker rooms, and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing provided for employees. The contractor shall provide separate or single-user restrooms and necessary dressing or sleeping areas to assure privacy between sexes.

IV. DAVIS-BACON AND RELATED ACT PROVISIONS

This section is applicable to all Federal-aid construction projects exceeding $2,000 and to all related subcontracts and lower-tier subcontracts (regardless of subcontract size). The requirements apply to all projects located within the right-of-way of a roadway that is functionally classified as Federal-aid highway. This excludes roadways functionally classified as local roads or rural minor collectors, which are exempt. Contracting agencies may elect to apply these requirements to other projects.

The following provisions are from the U.S. Department of Labor regulations in 29 CFR 5.5 “Contract provisions and related matters” with minor revisions to conform to the FHWA-1273 format and FHWA program requirements.

1. Minimum wages

a. All laborers and mechanics employed or working upon the site of the work, will be paid unconditionally and not less often than once a week, and without subsequent deduction or rebate on any account (except such payroll deductions as are permitted by regulations issued by the Secretary of Labor under the Copeland Act (29 CFR part 3)), the full amount of wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment computed at rates not less than those contained in the wage determination of the Secretary of Labor which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the contractor and such laborers and mechanics.

Contributions made or costs reasonably anticipated for bona fide fringe benefits under section 1(b)(2) of the Davis-Bacon Act on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of paragraph 1.d. of this section; also, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs which cover the particular weekly period, are deemed to be constructively made or incurred during such weekly period. Such laborers and mechanics shall be paid the appropriate wage rate and fringe benefits on the wage determination for the classification of work actually performed, without regard to skill, except as provided in 29 CFR 5.5(a)(4). Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein: Provided, That the employer's payroll records accurately set forth the time spent in each classification in which work is performed. The wage determination (including any additional classification and wage rates conformed under paragraph 1.b. of this section) and the Davis-Bacon poster (WH–1321) shall be posted at all times by the contractor and its subcontractors at the site of the work in a prominent and accessible place where it can be easily seen by the workers.

b.(1) The contracting officer shall require that any class of laborers or mechanics, including helpers, which is not listed in the wage determination and which is to be employed under the contract shall be classified in conformance with the wage determination. The contracting officer shall approve an additional classification and wage rate and fringe benefits therefore only when the following criteria have been met:

(i) The work to be performed by the classification requested is not performed by a classification in the wage determination; and

(ii) The classification is utilized in the area by the construction industry; and

(iii) The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination.

(2) If the contractor and the laborers and mechanics to be employed in the classification (if known), or their representatives, and the contracting officer agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), a report of the action taken shall be sent by the contracting officer to the Administrator of the Wage and Hour Division, Employment Standards Administration, U.S. Department of Labor, Washington, DC 20210. The Administrator, or an authorized representative, will approve, modify, or disapprove every additional classification action within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.

(3) In the event the contractor, the laborers or mechanics to be employed in the classification or their representatives, and the contracting officer do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), the contracting officer shall refer the questions, including the views of all interested parties and the recommendation of the contracting officer, to the Wage and Hour Administrator for determination. The Wage and Hour Administrator, or an authorized representative, will issue a determination within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.

(4) The wage rate (including fringe benefits where appropriate) determined pursuant to paragraphs 1.b.(2) or 1.b.(3) of this section, shall be paid to all workers performing work in the classification under this contract from the first day on which work is performed in the classification.

c. Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the contractor shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly cash equivalent thereof.

d. If the contractor does not make payments to a trustee or other third person, the contractor may consider as part of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program, Provided, That the Secretary of Labor has found, upon the written request of the contractor, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the contractor to set aside in a separate account assets for the meeting of obligations under the plan or program.

2. Withholding

The contracting agency shall upon its own action or upon written request of an authorized representative of the Department of Labor, withhold or cause to be withheld from the contractor under this contract, or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to Davis-Bacon prevailing wage requirements, which is held by the same prime contractor, so much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics, including apprentices, trainees, and helpers, employed by the contractor or any subcontractor the full amount of wages required by the contract. In the event of failure to pay any laborer or mechanic, including any apprentice, trainee, or helper, employed or working on the site of the work, all or part of the wages required by the contract, the contracting agency may, after written notice to the contractor, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased.

3. Payrolls and basic records

a. Payrolls and basic records relating thereto shall be maintained by the contractor during the course of the work and preserved for a period of three years thereafter for all laborers and mechanics working at the site of the work. Such records shall contain the name, address, and social security number of each such worker, his or her correct classification, hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalents thereof of the types described in section 1(b)(2)(B) of the Davis-Bacon Act), daily and weekly number of hours worked, deductions made and actual wages paid. Whenever the Secretary of Labor has found under 29 CFR 5.5(a)(1)(iv) that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in section 1(b)(2)(B) of the Davis-Bacon Act, the contractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, and that the plan or program has been communicated in writing to the laborers or mechanics affected, and records which show the costs anticipated or the actual cost incurred in providing such benefits. Contractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprenticeship programs and certification of trainee programs, the registration of the apprentices and trainees, and the ratios and wage rates prescribed in the applicable programs.

b.(1) The contractor shall submit weekly for each week in which any contract work is performed a copy of all payrolls to the contracting agency. The payrolls submitted shall set out accurately and completely all of the information required to be maintained under 29 CFR 5.5(a)(3)(i), except that full social security numbers and home addresses shall not be included on weekly transmittals. Instead the payrolls shall only need to include an individually identifying number for each employee (e.g. , the last four digits of the employee's social security number). The required weekly payroll information may be submitted in any form desired. Optional Form WH–347 is available for this purpose from the Wage and Hour Division Web site at http://www.dol.gov/esa/whd/forms/wh347instr.htm or its successor site. The prime contractor is responsible for the submission of copies of payrolls by all subcontractors. Contractors and subcontractors shall maintain the full social security number and current address of each covered worker,

and shall provide them upon request to the contracting agency for transmission to the State DOT, the FHWA or the Wage and Hour Division of the Department of Labor for purposes of an investigation or audit of compliance with prevailing wage requirements. It is not a violation of this section for a prime contractor to require a subcontractor to provide addresses and social security numbers to the prime contractor for its own records, without weekly submission to the contracting agency..

(2) Each payroll submitted shall be accompanied by a "Statement of Compliance," signed by the contractor or subcontractor or his or her agent who pays or supervises the payment of the persons employed under the contract and shall certify the following:

(i) That the payroll for the payroll period contains the information required to be provided under §5.5 (a)(3)(ii) of Regulations, 29 CFR part 5, the appropriate information is being maintained under §5.5 (a)(3)(i) of Regulations, 29 CFR part 5, and that such information is correct and complete;

(ii) That each laborer or mechanic (including each helper, apprentice, and trainee) employed on the contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in Regulations, 29 CFR part 3;

(iii) That each laborer or mechanic has been paid not less than the applicable wage rates and fringe benefits or cash equivalents for the classification of work performed, as specified in the applicable wage determination incorporated into the contract.

(3) The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH–347 shall satisfy the requirement for submission of the "Statement of Compliance" required by paragraph 3.b.(2) of this section.

(4) The falsification of any of the above certifications may subject the contractor or subcontractor to civil or criminal prosecution under section 1001 of title 18 and section 231 of title 31 of the United States Code.

c. The contractor or subcontractor shall make the records required under paragraph 3.a. of this section available for inspection, copying, or transcription by authorized representatives of the contracting agency, the State DOT, the FHWA, or the Department of Labor, and shall permit such representatives to interview employees during working hours on the job. If the contractor or subcontractor fails to submit the required records or to make them available, the FHWA may, after written notice to the contractor, the contracting agency or the State DOT, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to make such records available may be grounds for debarment action pursuant to 29 CFR 5.12.

4. Apprentices and trainees

a. Apprentices (programs of the USDOL).

Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the U.S. Department of Labor, Employment and Training Administration, Office of Apprenticeship Training, Employer and Labor Services, or with a State Apprenticeship Agency recognized by the Office, or if a person is employed in his or her first 90 days of probationary employment as an apprentice in such an apprenticeship program, who is not individually registered in the program, but who has been certified by the Office of Apprenticeship Training, Employer and Labor Services or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice.

The allowable ratio of apprentices to journeymen on the job site in any craft classification shall not be greater than the ratio permitted to the contractor as to the entire work force under the registered program. Any worker listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated above, shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any apprentice performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. Where a contractor is performing construction on a project in a locality other than that in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyman's hourly rate) specified in the contractor's or subcontractor's registered program shall be observed.

Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeymen hourly rate specified in the applicable wage determination. Apprentices shall be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator determines that a different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination.

In the event the Office of Apprenticeship Training, Employer and Labor Services, or a State Apprenticeship Agency recognized by the Office, withdraws approval of an apprenticeship program, the contractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

b. Trainees (programs of the USDOL).

Except as provided in 29 CFR 5.16, trainees will not be permitted to work at less than the predetermined rate for the

work performed unless they are employed pursuant to and individually registered in a program which has received prior approval, evidenced by formal certification by the U.S. Department of Labor, Employment and Training Administration.

The ratio of trainees to journeymen on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration.

Every trainee must be paid at not less than the rate specified in the approved program for the trainee's level of progress, expressed as a percentage of the journeyman hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed on the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the corresponding journeyman wage rate on the wage determination which provides for less than full fringe benefits for apprentices. Any employee listed on the payroll at a trainee rate who is not registered and participating in a training plan approved by the Employment and Training Administration shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed.

In the event the Employment and Training Administration withdraws approval of a training program, the contractor will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

c. Equal employment opportunity. The utilization of apprentices, trainees and journeymen under this part shall be in conformity with the equal employment opportunity requirements of Executive Order 11246, as amended, and 29 CFR part 30.

d. Apprentices and Trainees (programs of the U.S. DOT).

Apprentices and trainees working under apprenticeship and skill training programs which have been certified by the Secretary of Transportation as promoting EEO in connection with Federal-aid highway construction programs are not subject to the requirements of paragraph 4 of this Section IV. The straight time hourly wage rates for apprentices and trainees under such programs will be established by the particular programs. The ratio of apprentices and trainees to journeymen shall not be greater than permitted by the terms of the particular program.

5. Compliance with Copeland Act requirements. The contractor shall comply with the requirements of 29 CFR part 3, which are incorporated by reference in this contract.

6. Subcontracts. The contractor or subcontractor shall insert Form FHWA-1273 in any subcontracts and also require the subcontractors to include Form FHWA-1273 in any lower tier subcontracts. The prime contractor shall be responsible for the compliance by any subcontractor or lower tier subcontractor with all the contract clauses in 29 CFR 5.5.

7. Contract termination: debarment. A breach of the contract clauses in 29 CFR 5.5 may be grounds for termination of the contract, and for debarment as a contractor and a subcontractor as provided in 29 CFR 5.12.

8. Compliance with Davis-Bacon and Related Act requirements. All rulings and interpretations of the Davis-Bacon and Related Acts contained in 29 CFR parts 1, 3, and 5 are herein incorporated by reference in this contract.

9. Disputes concerning labor standards. Disputes arising out of the labor standards provisions of this contract shall not be subject to the general disputes clause of this contract. Such disputes shall be resolved in accordance with the procedures of the Department of Labor set forth in 29 CFR parts 5, 6, and 7. Disputes within the meaning of this clause include disputes between the contractor (or any of its subcontractors) and the contracting agency, the U.S. Department of Labor, or the employees or their representatives.

10. Certification of eligibility.

a. By entering into this contract, the contractor certifies that neither it (nor he or she) nor any person or firm who has an interest in the contractor's firm is a person or firm ineligible to be awarded Government contracts by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

b. No part of this contract shall be subcontracted to any person or firm ineligible for award of a Government contract by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

c. The penalty for making false statements is prescribed in the U.S. Criminal Code, 18 U.S.C. 1001.

V. CONTRACT WORK HOURS AND SAFETY STANDARDS ACT

The following clauses apply to any Federal-aid construction contract in an amount in excess of $100,000 and subject to the overtime provisions of the Contract Work Hours and Safety Standards Act. These clauses shall be inserted in addition to the clauses required by 29 CFR 5.5(a) or 29 CFR 4.6. As used in this paragraph, the terms laborers and mechanics include watchmen and guards.

1. Overtime requirements. No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which he or she is employed on such work to

work in excess of forty hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty hours in such workweek.

2. Violation; liability for unpaid wages; liquidated damages. In the event of any violation of the clause set forth in paragraph (1.) of this section, the contractor and any subcontractor responsible therefor shall be liable for the unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in paragraph (1.) of this section, in the sum of $10 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in paragraph (1.) of this section.

3. Withholding for unpaid wages and liquidated damages. The FHWA or the contacting agency shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any moneys payable on account of work performed by the contractor or subcontractor under any such contract or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime contractor, such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph (2.) of this section.

4. Subcontracts. The contractor or subcontractor shall insert in any subcontracts the clauses set forth in paragraph (1.) through (4.) of this section and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in paragraphs (1.) through (4.) of this section.

VI. SUBLETTING OR ASSIGNING THE CONTRACT

This provision is applicable to all Federal-aid construction contracts on the National Highway System.

1. The contractor shall perform with its own organization contract work amounting to not less than 30 percent (or a greater percentage if specified elsewhere in the contract) of the total original contract price, excluding any specialty items designated by the contracting agency. Specialty items may be performed by subcontract and the amount of any such specialty items performed may be deducted from the total original contract price before computing the amount of work required to be performed by the contractor's own organization (23 CFR 635.116).

a. The term “perform work with its own organization” refers to workers employed or leased by the prime contractor, and equipment owned or rented by the prime contractor, with or without operators. Such term does not include employees or equipment of a subcontractor or lower tier subcontractor, agents of the prime contractor, or any other assignees. The term may include payments for the costs of hiring leased employees from an employee leasing firm meeting all relevant Federal and State regulatory requirements. Leased employees may only be included in this term if the prime contractor meets all of the following conditions:

(1) the prime contractor maintains control over the supervision of the day-to-day activities of the leased employees;
(2) the prime contractor remains responsible for the quality of the work of the leased employees;
(3) the prime contractor retains all power to accept or exclude individual employees from work on the project; and
(4) the prime contractor remains ultimately responsible for the payment of predetermined minimum wages, the submission of payrolls, statements of compliance and all other Federal regulatory requirements.

b. "Specialty Items" shall be construed to be limited to work that requires highly specialized knowledge, abilities, or equipment not ordinarily available in the type of contracting organizations qualified and expected to bid or propose on the contract as a whole and in general are to be limited to minor components of the overall contract.

2. The contract amount upon which the requirements set forth in paragraph (1) of Section VI is computed includes the cost of material and manufactured products which are to be purchased or produced by the contractor under the contract provisions.

3. The contractor shall furnish (a) a competent superintendent or supervisor who is employed by the firm, has full authority to direct performance of the work in accordance with the contract requirements, and is in charge of all construction operations (regardless of who performs the work) and (b) such other of its own organizational resources (supervision, management, and engineering services) as the contracting officer determines is necessary to assure the performance of the contract.

4. No portion of the contract shall be sublet, assigned or otherwise disposed of except with the written consent of the contracting officer, or authorized representative, and such consent when given shall not be construed to relieve the contractor of any responsibility for the fulfillment of the contract. Written consent will be given only after the contracting agency has assured that each subcontract is evidenced in writing and that it contains all pertinent provisions and requirements of the prime contract.

5. The 30% self-performance requirement of paragraph (1) is not applicable to design-build contracts; however, contracting agencies may establish their own self-performance requirements.

VII. SAFETY: ACCIDENT PREVENTION

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts.

1. In the performance of this contract the contractor shall comply with all applicable Federal, State, and local laws governing safety, health, and sanitation (23 CFR 635). The contractor shall provide all safeguards, safety devices and protective equipment and take any other needed actions as it determines, or as the contracting officer may determine, to be reasonably necessary to protect the life and health of employees on the job and the safety of the public and to protect property in connection with the performance of the work covered by the contract.

2. It is a condition of this contract, and shall be made a condition of each subcontract, which the contractor enters into pursuant to this contract, that the contractor and any subcontractor shall not permit any employee, in performance of the contract, to work in surroundings or under conditions which are unsanitary, hazardous or dangerous to his/her health or safety, as determined under construction safety and health standards (29 CFR 1926) promulgated by the Secretary of Labor, in accordance with Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C. 3704).

3. Pursuant to 29 CFR 1926.3, it is a condition of this contract that the Secretary of Labor or authorized representative thereof, shall have right of entry to any site of contract performance to inspect or investigate the matter of compliance with the construction safety and health standards and to carry out the duties of the Secretary under Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C.3704).

VIII. FALSE STATEMENTS CONCERNING HIGHWAY PROJECTS

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts.

In order to assure high quality and durable construction in conformity with approved plans and specifications and a high degree of reliability on statements and representations made by engineers, contractors, suppliers, and workers on Federal-aid highway projects, it is essential that all persons concerned with the project perform their functions as carefully, thoroughly, and honestly as possible. Willful falsification, distortion, or misrepresentation with respect to any facts related to the project is a violation of Federal law. To prevent any misunderstanding regarding the seriousness of these and similar acts, Form FHWA-1022 shall be posted on each Federal-aid highway project (23 CFR 635) in one or more places where it is readily available to all persons concerned with the project:

18 U.S.C. 1020 reads as follows:

"Whoever, being an officer, agent, or employee of the United States, or of any State or Territory, or whoever, whether a person, association, firm, or corporation, knowingly makes any false statement, false representation, or false report as to the character, quality, quantity, or cost of the material used or to be used, or the quantity or quality of the work performed or to be performed, or the cost thereof in connection with the submission of plans, maps, specifications, contracts, or costs of construction on any highway or related project submitted for approval to the Secretary of Transportation; or

Whoever knowingly makes any false statement, false representation, false report or false claim with respect to the character, quality, quantity, or cost of any work performed or to be performed, or materials furnished or to be furnished, in connection with the construction of any highway or related project approved by the Secretary of Transportation; or

Whoever knowingly makes any false statement or false representation as to material fact in any statement, certificate, or report submitted pursuant to provisions of the Federal-aid Roads Act approved July 1, 1916, (39 Stat. 355), as amended and supplemented;

Shall be fined under this title or imprisoned not more than 5 years or both."

IX. IMPLEMENTATION OF CLEAN AIR ACT AND FEDERAL WATER POLLUTION CONTROL ACT

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts.

By submission of this bid/proposal or the execution of this contract, or subcontract, as appropriate, the bidder, proposer, Federal-aid construction contractor, or subcontractor, as appropriate, will be deemed to have stipulated as follows:

1. That any person who is or will be utilized in the performance of this contract is not prohibited from receiving an award due to a violation of Section 508 of the Clean Water Act or Section 306 of the Clean Air Act.
2. That the contractor agrees to include or cause to be included the requirements of paragraph (1) of this Section X in every subcontract, and further agrees to take such action as the contracting agency may direct as a means of enforcing such requirements.

X. CERTIFICATION REGARDING DEBARMENT, SUSPENSION, INELIGIBILITY AND VOLUNTARY EXCLUSION

This provision is applicable to all Federal-aid construction contracts, design-build contracts, subcontracts, lower-tier subcontracts, purchase orders, lease agreements, consultant contracts or any other covered transaction requiring FHWA approval or that is estimated to cost $25,000 or more – as defined in 2 CFR Parts 180 and 1200.

1**. Instructions for Certification – First Tier Participants:**

a. By signing and submitting this proposal, the prospective first tier participant is providing the certification set out below.

b. The inability of a person to provide the certification set out below will not necessarily result in denial of participation in this covered transaction. The prospective first tier participant shall submit an explanation of why it cannot provide the certification set out below. The certification or explanation will be considered in connection with the department or agency's determination whether to enter into this transaction. However, failure of the prospective first tier participant to furnish a certification or an explanation shall disqualify such a person from participation in this transaction.

c. The certification in this clause is a material representation of fact upon which reliance was placed when the contracting agency determined to enter into this transaction. If it is later determined that the prospective participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the contracting agency may terminate this transaction for cause of default.

d. The prospective first tier participant shall provide immediate written notice to the contracting agency to whom this proposal is submitted if any time the prospective first tier participant learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstances.

e. The terms "covered transaction," "debarred," "suspended," "ineligible," "participant," "person," "principal," and "voluntarily excluded," as used in this clause, are defined in 2 CFR Parts 180 and 1200. “First Tier Covered Transactions” refers to any covered transaction between a grantee or subgrantee of Federal funds and a participant (such as the prime or general contract). “Lower Tier Covered Transactions” refers to any covered transaction under a First Tier Covered Transaction (such as subcontracts). “First Tier Participant” refers to the participant who has entered into a covered transaction with a grantee or subgrantee of Federal funds (such as the prime or general contractor). “Lower Tier Participant” refers any participant who has entered into a covered transaction with a First Tier Participant or other Lower Tier Participants (such as subcontractors and suppliers).

f. The prospective first tier participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency entering into this transaction.

g. The prospective first tier participant further agrees by submitting this proposal that it will include the clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transactions," provided by the department or contracting agency, entering into this covered transaction, without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions exceeding the $25,000 threshold.

h. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant is responsible for ensuring that its principals are not suspended, debarred, or otherwise ineligible to participate in covered transactions. To verify the eligibility of its principals, as well as the eligibility of any lower tier prospective participants, each participant may, but is not required to, check the Excluded Parties List System website (https://www.epls.gov/), which is compiled by the General Services Administration.

i. Nothing contained in the foregoing shall be construed to require the establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of the prospective participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

j. Except for transactions authorized under paragraph (f) of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency may terminate this transaction for cause or default.

* * * * *

2. Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion – First Tier Participants:

a. The prospective first tier participant certifies to the best of its knowledge and belief, that it and its principals:

(1) Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participating in covered transactions by any Federal department or agency;

(2) Have not within a three-year period preceding this proposal been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;

(3) Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State or local) with commission of any of the offenses enumerated in paragraph (a)(2) of this certification; and

(4) Have not within a three-year period preceding this application/proposal had one or more public transactions (Federal, State or local) terminated for cause or default.

b. Where the prospective participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

2. **Instructions for Certification - Lower Tier Participants:**

(Applicable to all subcontracts, purchase orders and other lower tier transactions requiring prior FHWA approval or

estimated to cost $25,000 or more - 2 CFR Parts 180 and 1200)

a. By signing and submitting this proposal, the prospective lower tier is providing the certification set out below.

b. The certification in this clause is a material representation of fact upon which reliance was placed when this transaction was entered into. If it is later determined that the prospective lower tier participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the department, or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.

c. The prospective lower tier participant shall provide immediate written notice to the person to which this proposal is submitted if at any time the prospective lower tier participant learns that its certification was erroneous by reason of changed circumstances.

d. The terms "covered transaction," "debarred," "suspended," "ineligible," "participant," "person," "principal," and "voluntarily excluded," as used in this clause, are defined in 2 CFR Parts 180 and 1200. You may contact the person to which this proposal is submitted for assistance in obtaining a copy of those regulations. “First Tier Covered Transactions” refers to any covered transaction between a grantee or subgrantee of Federal funds and a participant (such as the prime or general contract). “Lower Tier Covered Transactions” refers to any covered transaction under a First Tier Covered Transaction (such as subcontracts). “First Tier Participant” refers to the participant who has entered into a covered transaction with a grantee or subgrantee of Federal funds (such as the prime or general contractor). “Lower Tier Participant” refers any participant who has entered into a covered transaction with a First Tier Participant or other Lower Tier Participants (such as subcontractors and suppliers).

e. The prospective lower tier participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency with which this transaction originated.

f. The prospective lower tier participant further agrees by submitting this proposal that it will include this clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transaction," without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions exceeding the $25,000 threshold.

g. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant is responsible for ensuring that its principals are not suspended, debarred, or otherwise ineligible to participate in covered transactions. To verify the eligibility of its principals, as well as the eligibility of any lower tier prospective participants, each participant may, but is not required to, check the Excluded Parties List System website (https://www.epls.gov/), which is compiled by the General Services Administration.

h. Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

i. Except for transactions authorized under paragraph e of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.

* * * * *

Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion--Lower Tier Participants:

1. The prospective lower tier participant certifies, by submission of this proposal, that neither it nor its principals is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participating in covered transactions by any Federal department or agency.

2. Where the prospective lower tier participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

* * * * *

XI. CERTIFICATION REGARDING USE OF CONTRACT FUNDS FOR LOBBYING

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts which exceed $100,000 (49 CFR 20).

1. The prospective participant certifies, by signing and submitting this bid or proposal, to the best of his or her knowledge and belief, that:

a. No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

b. If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or

attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

2. This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by 31 U.S.C. 1352. Any person who fails to file the required certification shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such failure.

3. The prospective participant also agrees by submitting its bid or proposal that the participant shall require that the language of this certification be included in all lower tier subcontracts, which exceed $100,000 and that all such recipients shall certify and disclose accordingly.

ATTACHMENT A - EMPLOYMENT AND MATERIALS PREFERENCE FOR APPALACHIAN DEVELOPMENT HIGHWAY SYSTEM OR APPALACHIAN LOCAL ACCESS ROAD CONTRACTS

This provision is applicable to all Federal-aid projects funded under the Appalachian Regional Development Act of 1965.

1. During the performance of this contract, the contractor undertaking to do work which is, or reasonably may be, done as on-site work, shall give preference to qualified persons who regularly reside in the labor area as designated by the DOL wherein the contract work is situated, or the subregion, or the Appalachian counties of the State wherein the contract work is situated, except:

a. To the extent that qualified persons regularly residing in the area are not available.

b. For the reasonable needs of the contractor to employ supervisory or specially experienced personnel necessary to assure an efficient execution of the contract work.

c. For the obligation of the contractor to offer employment to present or former employees as the result of a lawful collective bargaining contract, provided that the number of nonresident persons employed under this subparagraph (1c) shall not exceed 20 percent of the total number of employees employed by the contractor on the contract work, except as provided in subparagraph (4) below.

2. The contractor shall place a job order with the State Employment Service indicating (a) the classifications of the laborers, mechanics and other employees required to perform the contract work, (b) the number of employees required in each classification, (c) the date on which the participant estimates such employees will be required, and (d) any other pertinent information required by the State Employment Service to complete the job order form. The job order may be placed with the State Employment Service in writing or by telephone. If during the course of the contract work, the information submitted by the contractor in the original job order is substantially modified, the participant shall promptly notify the State Employment Service.

3. The contractor shall give full consideration to all qualified job applicants referred to him by the State Employment Service. The contractor is not required to grant employment to any job applicants who, in his opinion, are not qualified to perform the classification of work required.

4. If, within one week following the placing of a job order by the contractor with the State Employment Service, the State Employment Service is unable to refer any qualified job applicants to the contractor, or less than the number requested, the State Employment Service will forward a certificate to the contractor indicating the unavailability of applicants. Such certificate shall be made a part of the contractor's permanent project records. Upon receipt of this certificate, the contractor may employ persons who do not normally reside in the labor area to fill positions covered by the certificate, notwithstanding the provisions of subparagraph (1c) above.

5. The provisions of 23 CFR 633.207(e) allow the contracting agency to provide a contractual preference for the use of mineral resource materials native to the Appalachian region.

6. The contractor shall include the provisions of Sections 1 through 4 of this Attachment A in every subcontract for work which is, or reasonably may be, done as on-site work.