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120th Avenue & Northaven Circle Traffic Signal Design
Project No. SHO M286-050
Subaccount No. 24696

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SECTION 1 TRAFFIC SIGNAL SPECIFICATIONS

1.0 General Requirements

These specifications for traffic signals shall govern the materials used for and the installation of traffic signals.

Construction of traffic signal systems shall be done in accordance with these specifications, the 2009 Edition of the Manual on Uniform Traffic Control Devices (MUTCD) for Streets and Highways, published by the FHWA, the latest revision of the Colorado Supplement, thereto, and in conformity with the details as shown on the plans.

The Contractor shall have an IMSA Certified Traffic Signal Level II Technician on-site during the period of any splicing and/or termination of wiring for head and controller installation and shall provide the Owner with a copy of the individual's certification prior to the start of work.

1.1 Conditions of Materials Furnished

Items furnished shall be new state-of-the-art equipment and materials. The Contractor shall submit for review and approval a list of equipment and materials as indicated in Appendix B – Submittals that are proposed to be installed, prior to the Contractor ordering such materials. Each item shall be identified by the trade name, size, and catalog number.

Traffic control equipment installed in the controller cabinet shall be products from the same manufacturer, or fully compatible if equipment from more than one manufacturer is used. At existing traffic signal installations being rebuilt, all traffic control equipment furnished by the Contractor shall be compatible with the existing equipment that will remain.

The Contractor shall supply and install all necessary materials, equipment, and labor for the complete installation and operation of the traffic signal system whether specifically mentioned or not on the traffic signal plans and in these specifications. The furnishing and installing of such non-listed items shall be considered incidental to the contract.

The Contractor shall supply and furnish all labor, tools, equipment, and incidentals necessary to complete the project in an efficient and workmanlike manner.

1.2 Definitions

General

Whenever in these specifications or in other contract documents special engineering terms and words are used, the intent and meaning shall be as defined in the Traffic Engineering Handbook, Institute of Transportation Engineers, latest edition and the Transportation Planning Handbook, Institute of Transportation Engineers, latest edition.

The following special terms and words shall have meanings as defined below:

AASHTO	-	American Association of State Highways and Transportation Officials
ANSI	-	American National Standards Institute
ASTM	-	American Society for Testing Materials
CDOT	-	Colorado Department of Transportation
FHWA	-	Federal Highway Administration
IMSA	-	International Municipal Signal Association
ITE	-	Institute of Transportation Engineers
NEC	-	National Electrical Code
NEMA	-	National Electrical Manufacturers Association
SSRBC	-	CDOT Standard Specifications for Road and Bridge Construction
UL	-	Underwriters Laboratories, Inc.

1.3 Regulations and Codes

In addition to the requirements of the plans, these specifications, the Special Conditions, and the General Conditions, all items and workmanship shall conform to the requirements of the National Electrical Code (NEC) hereinafter referred to as the Code; Rules for Overhead Electrical Line Construction of the Colorado Public Utilities Commission; standards of ASTM, ANSI, and local ordinances which may apply.

Wherever reference is made to any of the standards mentioned above, the reference shall be construed to mean the Code, order, or standard that is in effect on the date of advertisement for bids.

1.4 Schedule of Work and Working Conditions

The Contractor shall provide constant attention to the work necessary to facilitate the progress thereof, and shall cooperate with the Owner, utility representatives and other contractors in every way possible.

At the end of each working period, all excavations shall be barricaded and/or covered to provide safe pedestrian and vehicular passage.

At points where the Contractor's operations are adjacent to properties of traffic signal interconnect, railway, telegraph, telephone, power companies, cable television or any other utility to which damage might result in considerable expense, loss or inconvenience, work shall not be commenced until all arrangements necessary for the protection, thereof,

shall have been made.

The Contractor shall cooperate with owners of all underground and overhead utility lines in their removal and rearrangement operations in order that these operations may progress in a reasonable manner, that duplication or rearrangement work be reduced to a minimum, and that services rendered by those parties not be unnecessarily interrupted.

In the event of interruption of water or utility services as a result of accidental breakage; being exposed or unsupported, the Contractor shall promptly notify the proper authority and shall cooperate with the authority in restoration of service. If water service is interrupted, repair work shall be continuous until the service is restored. Work shall not be undertaken around fire hydrants until approved by the local fire authority.

1.5 Distribution of Keys and Instruction Manuals

When the project is complete, two keys for each controller cabinet and police panel shall be delivered to the Owner. The instruction manual for the controller shall be left inside the controller cabinet.

1.6 Contractor Supplied Documents

Upon completion of the Work, the Contractor shall submit as-built drawings or corrected plans and/or additional data required by the Owner to show in detail all construction changes. This shall include, but not be limited to wiring, cable, location, depth of conduit, and modifications to original cabinet wiring.

The Contractor shall submit two sets of schematic wiring diagrams to the Owner for the traffic signal controller, the signal installation's light circuits and auxiliary equipment, including units and values of each component used in the cabinet. The diagrams shall show in detail circuits and components. Such components shown, thereon, shall be identified by name or number and in such a manner as to be readily interpreted.

All diagrams, plans, and drawings shall be prepared using graphic symbols shown in ANSI Y32.2, *Graphic Symbols for Electrical and Electronic Diagrams*.

One copy of the controller cabinet diagram and the intersection and phase diagram, as approved by the Owner, shall be placed in a heavy duty plastic envelope with side opening, and placed inside of each controller cabinet in the plan drawer prior to Initial Acceptance of the project.

1.7 Maintaining Existing Traffic Signal Operations

Existing traffic signals shall be kept in effective operation for the benefit of the traveling public by the Contractor.

At intersections where power to the signals must be turned off, the Contractor shall contact the Owner requesting a Police Officer(s). This request must be made at least two weeks prior to the time the officer is needed.

The above does not apply to intersections which are completely closed to traffic due to construction.

The Contractor shall maintain a minimum of two three-section (red, yellow, green) traffic signal heads for each approach. Lane assignment changes during construction at existing or temporary traffic signals with video detection shall have the detection zones modified to reflect the lane assignments. In the event that temporary signals are necessary to maintain the minimum signal display, the Contractor shall be responsible for furnishing materials, equipment, tools, and labor necessary to install and maintain the temporary signals. Temporary signals must be in the plans or be approved by the Owner prior to installation. The Contractor shall maintain any temporary signal installed. The City shall furnish electrical energy for operation of a temporary signal.

Temporary span-wire traffic signals are not permitted unless shown on the plans or approved in writing by the Owner.

1.8 Field Test of Equipment

Prior to completion of Work, the Contractor shall make the following tests on traffic signal circuits in the presence of the Owner and the controller representative, if a new controller is used (the Contractor shall notify the Owner 48 hours prior to conducting the tests):

1. Each circuit shall be tested for continuity.
2. Each circuit shall be tested for grounds.
3. An insulation resistance test shall be made on each circuit between the circuit and a ground. The insulation resistance shall not be less than the values specified in the provisions of the NEC code.
4. Initial functional testing of a new traffic signal system shall be completed while the traffic signal heads are bagged. Heads shall be bagged with orange colored covers.
5. Louvers, hoods, and signal heads shall be directed to provide maximum visibility.
6. Initial activation shall be between 9:00 a.m. and 2:00 p.m., unless otherwise specified or shown on the plans. Prior to activation, the equipment shown on the plans shall be installed and operable. This includes, but is not an inclusive list: pedestrian signals; pedestrian push buttons; vehicle detectors; system communications; and Opticom. Any exceptions to this must be approved by the Owner.
7. Flash and permanent activation shall have the Owner present.
8. The signal shall be run on flash cycle for a minimum of twenty-four hours prior to turn-on. After flash operations a functional test shall be made which demonstrates that every part of the system functions as specified. The functional test for each traffic signal system shall consist of at least five days of continuous satisfactory operation. If unsatisfactory performance of the system develops, the conditions shall be corrected and the test shall be repeated until five days of continuous, satisfactory operation is obtained.
9. Prior to the functional test, the contractor shall make every effort to have resolved all operating difficulties and problems. Components of the system must be complete and in operational condition to the satisfaction of the Owner prior to the functional tests being performed.

Functional tests shall start on any working day except Friday or the day preceding a legal holiday, or on a legal holiday. The owner reserves the right to require the test on any day of the calendar week.

During the test period, the Owner will provide the electrical energy. Repair costs of any damage caused by public traffic and all other maintenance costs will be the responsibility of the Contractor until Initial Acceptance of the project by the Owner.

1.9 Activation of Traffic Signal Equipment

Activation of new or modified signal systems shall be made only after all traffic signal circuits have been thoroughly tested as specified and the Owner concurs with the activation.

1.10 Intersection Power

The Contractor shall coordinate with Xcel Energy or United Power sufficiently prior to the signal turn-on so that orders may be issued for power connection to the intersection on the specified turn-on date. The Contractor shall also coordinate with Xcel Energy to ensure that each intersection is checked for and meets the appropriate power requirements for the traffic signal and other equipment.

1.11 Permits

The Contractor shall obtain a Traffic Control Permit from the City of Thornton Traffic division and a construction permit from the City of Thornton Engineering Services division. Construction permits can be applied for online free of charge by using the "CIP Projects" link. Contact Claire Dreesen at 720-977-6247 for additional information.

1.12 Concrete Work, Asphalt Work, Aggregate Base Course

All concrete work, asphalt work and aggregate base course installation to be performed under this Contract shall conform to the requirements of the **Colorado Department of Transportation's Standard Specifications for Road and Bridge Construction, Latest Edition or as otherwise specified in these specifications and plans**. Traffic signal pole foundation concrete shall be Class BZ. Sidewalk concrete shall be Class B with a fiber mesh.

SECTION 2

TRAFFIC SIGNAL, LIGHTING, AND COMMUNICATION CONDUIT

2.0 General Requirements

Underground utility information shown on the plans is for information only. The Contractor is responsible for field locating and verifying utility information before starting installation of underground conduit runs and traffic signal pole foundations.

The Contractor shall cooperate with any other Contractor under contract with the Owner and with utility companies providing services to the City of Thornton while installing underground conduit runs.

Electrical conduit shall be installed in accordance with the applicable requirements described in the latest revision of the Colorado Department of Transportation Utility Manual, as amended.

All buried wiring included in this project shall be placed in a conduit. It will be the option of the Contractor, at his own expense, to use larger size conduit if desired. Where larger size conduit is used, it shall be for the entire length of the run from outlet to pull box or from pull box to pull box. No reducing coupling will be permitted in any conduit run. The Owner must approve increased sizes prior to installation.

Conduits shall be installed under existing pavement through use of directional boring operations. Conduits under pavement may be installed through use of open trench operations only where approved by the Owner.

Conduits shall be rigid plastic (PVC) or galvanized rigid steel (GRC) type conforming to the plans and these specifications. Conduit runs shown on the plans are tentative as to routing and may be changed as directed by the Owner to avoid underground obstructions. In the event of any change from the location shown on the plans, accurate records shall be incorporated into the as-built drawings, and all necessary details and as-built drawings submitted to the Owner before final payment is made.

Conduit installation shall include the installation of marking tape laid in the backfilled trench at a depth not more than 8 inches or less than 4 inches below finished grade. Heavy gauge polyethylene film (0.004 inch tape, with legend "Caution Buried Electric Line Below"), shall be used. Where tape length ends and conduit run continues, lapping of not less than 6 inches will be provided. No glue or adhesive will be allowed to join separate tape sections.

2.1 Nonmetallic Conduit (PVC)

Rigid PVC conduit shall be Schedule 80, Type 2 and shall be manufactured of high-impact PVC, and shall conform to industry and commercial standards No. CS-207-60. Each length of PVC conduit and the various PVC fittings (coupling, adapter, etc.) shall bear the label of Underwriter's Laboratories, Inc., or be approved by the Owner. The conduit shall be of the size or sizes shown on the plans or as indicated in these specifications.

Rigid PVC conduit ends shall be squared and trimmed after cutting to remove rough edges. All connections shall be made using E-Loc couplings or approved equal.

Rigid PVC conduit shall only be used for underground installations; conduit used above ground shall be galvanized rigid steel.

2.2 Galvanized Rigid Conduit Steel (GRC)

Steel conduit and fittings shall be rigid galvanized steel and shall be uniformly and adequately zinc-coated by the hot-dipped process conforming to ASTM Designation A153. Joints shall be set up tight with squared ends. Fastenings shall be secured and of a type appropriate in design and dimensions for the particular applications. Couplings, connectors, and fittings shall be approved types specifically designed and manufactured for the purpose. Fittings shall be installed to provide a good electrical ground throughout the conduit system. The interior as well as the exterior of a 6-inch sample cut from a center of a standard length of conduit when tested in accordance with the applicable portion of ASTM Designation A239 shall not show a fixed deposit of copper after four one-minute immersions in the standard copper sulfate solution. The interior of the rigid conduit shall have a continuous coating of lacquer or enamel. Each length shall bear the label of Underwriter's Laboratories, Inc., and shall conform to appropriate articles of the Code. The contractor shall provide catalog information for review by the Owner prior to purchase and installation of GRC.

The end of metallic conduit shall be threaded and well-reamed to remove burrs and rough edges. Field cuts shall be made true and square so that the ends will butt or come together for the full circumference, thereof. Slip joints or running thread will not be permitted for coupling conduit. When a standard coupling cannot be used, weatherproofed threaded three-piece union shall be used. All three-piece unions must be threaded; non-threaded couplings shall not be accepted.

The threads on all conduits shall be well painted with a good quality lead or rust-preventive paint before couplings are made up. All couplings shall be tightened until the ends of the conduits are brought together so that a good electrical connection will be made throughout the entire length of the conduit run. Conduit stubs, caps, and exposed threads, as well as any point along the surface of the conduit that has been injured in handling or installation, shall be painted with good quality asphalt bituminous or other paint suitable for the purpose.

2.3 Installation Methods

Conduit sizes and locations shall be as shown on the plans. Conduit shall be stubbed and capped for future uses where shown on the plans or where specified.

Existing empty underground conduit to be incorporated into a new system shall be cleaned with a mandrel or cylindrical wire brush and blown out with compressed air. The Contractor shall search for such conduit in the general vicinity shown on the plans, and shall notify the Owner in advance as to when this operation will take place. The Owner may, at his option, be present to monitor the activity. The cost of such activity shall be incidental to the project. In the event that such conduit has been rendered inoperative prior to the signal installation, the Contractor shall notify the Owner and payment for new conduit shall be made as per the unit costs provided in the bid.

Conduits terminating in poles, cabinets, and pedestal bases shall extend a maximum of 3 inches and a minimum of 2 inches above the foundation vertically, and shall be sloped toward hand holes in poles or base opening where transformer bases are used. Conduit entering pull boxes shall terminate a minimum of 2 inches and a maximum of 3 inches above the bottom of the box.

Conduit ends shall be accomplished by a ninety (90) degree elbow with a minimum radius of forty-eight (48) degrees. Where two (2) or more conduits meet, all ninety (90) degree elbows shall be brought together in the center of the pull box or cabinet foundation. Conduit shall only enter through the bottom of a pull box. Galvanized rigid conduit terminations within pull boxes shall be fitted with an end coupling as well as insulating bushings to prevent chafing the wire.

Conduits required to be terminated, stubbed, and plugged shall be as shown on the plans and as directed by the Owner. Conduit ends shall be capped with standard conduit caps. The location of ends of conduit for future electrical circuits under curbs, gutters, sidewalks, or structures shall be marked by a "Y" at least 3 inches high, cut into the face of the curb, gutter, or structure directly above the conduit.

Ends of unused metal type conduit shall be threaded and shall be capped with standard pipe caps until conductors are in place. When caps are removed, the threaded ends shall be provided with conduit bushings. Ends of unused non-metallic type conduit plugged with a removal conduit plug, ends of conduit populated with wire shall be plugged with duct seal putty to prevent water infiltration and rodent infestation of the conduit.

Conduit installed outside of the traveled portion of the roadway and out of future roadway areas shall be laid as follows: maximum depth of 30 inches and a minimum depth of 24 inches. Conduit installed under in the traveled portion of the roadway and under future roadway areas shall be laid at a minimum depth 36 inches.

Concrete replacement within roadway and/or intersection islands created by installation of conduit will not be paid for separately, but included in the unit price for conduit. Replacement of roadway, sidewalk, or native growth areas created by installation of conduit and/or potholes will not be paid for separately, but included in the unit price for conduit.

All conduits, including conduits from the home run pull box to the controller cabinet, shall include 14 gauge copper stranded tracer wire inside the conduit for future locating of conduits. The sheathing for the tracer wire shall be purple in color. A minimum of two feet of slack tracer wire shall be left in each pull box and in the controller cabinet.

2.4 Excavation and Backfilling

The excavations required for the installation of conduit shall be performed in such a manner as to avoid unnecessary damage to streets, sidewalks, landscaping and other improvements. Trenches shall not be excavated wider than necessary for the installation of the electrical appurtenances. Concrete removal limits shall be to the nearest pavement, sidewalk or curb and gutter control joint. Excavation shall not be performed until immediately before installation of conduits. The material from the excavation shall be placed in a position not to cause damage or obstruction to vehicular or pedestrian traffic or interfere with surface drainage.

Trenches outside the traveled portion of the roadway shall be backfilled with granular material as approved by the Owner, in six inch lifts and each lift compacted. Off-street trenches in native soil areas shall be backfilled with native soil and shall be compacted and shaped to match the surrounding surface. Surface materials in native soil areas disturbed by excavation and backfilling operations shall be replaced in kind equal to or exceeding original conditions. This shall include replacement of sod in lawn areas or reseeded in native soil areas at no additional cost to the project as directed by the Owner.

Trenches within islands, under sidewalks, in parking lots or other trenches in paved areas outside the traveled portion of the roadway shall be backfilled with Class 6 granular aggregate base course material as approved by the Owner. The backfill shall be in 6-inch lifts and each lift compacted up to a point within 3 inches of existing grade.

Trenches within or across the roadway, bike paths, trails and sidewalks shall be backfilled with CDOT-approved structural backfill (flow-fill) within 3 inches of existing grade, except on concrete surfaces which shall be removed to the nearest control joint and replaced in kind to match existing thickness, grade and finish. The top 3 inches of all trenches in asphalt roadways or asphalt off-roadway areas shall be filled to match existing grade and surfacing materials with hot asphalt mix. All roadways shall be repaired within forty-eight hours of cutting the surface.

Excavations in the street or highway shall be performed in such a manner that not more than one traffic lane is restricted in either direction at any time, unless otherwise permitted by the Owner. A minimum of one lane of traffic in each direction shall be kept open for each direction.

Excavations at intersections being reconstructed or improved shall be performed and backfilled before other improvements are completed so as to not require the repair or replacement of newly installed sidewalks, curbs and gutters, pavement, or landscaping.

Prior to backfilling, the Owner shall have the opportunity to inspect the trench, conduit and tape placement.

**SECTION 3
PULL BOXES**

3.0 General

Pull box locations shown on the plans are approximate. The Contractor shall locate the exact location in the field and the Contractor shall have the Owner agree to the location prior to installation. Pull boxes for traffic signal conduit runs shall not be spaced more than 150 feet apart from each other unless approved by the Owner. It shall be the option of the Contractor, at his expense, to install additional pull boxes that he may desire to facilitate his work as approved by the Owner.

Pull boxes shall be constructed of an aggregate material consisting of sand and gravel bound together with a polymer and reinforced with continuous woven glass strands. The material shall have the following mechanical properties.

- Compressive Strength - 11,000 psi
- Tensile Strength - 1,700 psi
- Flexural Strength - 7,500 psi

Pull boxes used for loop detectors on sampling stations shall be a minimum of twelve (12) inches wide by sixteen (16) inches long by twelve (12) inches deep. Pull boxes used at junctions of roadway conduit crossing shall be a minimum of twenty (20) inches long by thirty-three (33) inches wide by fifteen (15) inches deep. Pull boxes used for traffic signal communication interconnect shall be a minimum of twenty-four (24) inches long by thirty-six (36) inches wide by twenty-four (24) inches deep. Pull boxes at the controller cabinet shall be a minimum of thirty (30) inches long by forty-eight (48) inches wide by twenty-four (24) inches deep. Use of two (2) pull boxes in place of the larger one shall not be permitted. Other sizes may be approved by the Owner.

Pull box lids shall have a non-skid surface with a minimum coefficient of friction of 0.5. Covers shall hold a minimum vertical test load of 8,000 pounds over a 10-inch x 10-inch surface with no physical damage or excess deflection. Covers shall have the words Traffic Signal embossed on them and be concrete gray color.

Lids for pull boxes sized thirty (30) inches long by forty-eight (48) inches wide by twenty-four (24) inches deep or larger shall consist of two pieces capable of being removed from the pull box independently. The configuration of the two-piece lid shall be such that access to the pull box is unobstructed when both pieces are removed.

3.1 Installation

Pull boxes shown in the vicinity of curbs and gutters shall be placed adjacent to the back of the curb. Pull boxes adjacent to standards shall be placed along the side of foundations as shown on the plans.

The cover of the pull box shall be installed level with the finish grade. The cover of pull boxes located in sidewalks shall be installed level with the sidewalk. The bottom of all pull boxes shall rest on firm ground with 12 inches of three-quarters (3/4) inch to two (2) inch river run rock below the pull box for drainage. Pull boxes installed in a sidewalk must be tied into the sidewalk to prevent the boxes from being pushed down below the top of the sidewalk.

Pull boxes installed in dirt or landscaped areas shall have a twelve (12) inch wide by six (6) inch thick concrete collar placed around the top, level with the cover of the pull box and finish grade. All concrete collars shall be Portland cement concrete conforming to the applicable requirements for Class B as referenced in the SSRBC.

SECTION 4

TRAFFIC SIGNAL POLES AND MAST ARMS

4.0 General - Standard Type Poles

Traffic signal poles, mast arms, luminaire arms, and extensions will be furnished by the Owner. Fifteen-foot pedestal poles, ten-foot pedestal poles, and four-foot pedestal poles shall be provided by the contractor in conformance with Owner specifications.

Poles and mast arms are furnished with anchor bolts; nuts; washers; bolt nut covers; pole caps; mitigation devices; and door covers by the Owner. The contractor shall furnish all anchor bolts; nuts; washers; bolt nut covers; pedestal bases; pole caps and door covers for the fifteen-foot, ten-foot, and pedestrian button poles.

Roadway clearance at end of signal mast arm shall be 21 feet from roadway with side slope of two to three percent to the mast arm / pole connection.

Traffic signal poles, mast arms, concrete foundations, and necessary hardware shall conform to the appropriate requirements of Sections 601, 613, 713, and 715 of SSRBC.

4.1 Standard Poles

Poles shall be straight, with a permissive variation not to exceed 1-inch measured at the midpoint of a 30-foot or longer pole, and not to exceed 3/4-inch measured at the midpoint of a pole shorter than 30 feet.

Standard poles with mast arms shall have a hand hole located opposite the mast arm connection.

The circumference of the poles and mast arms shall be circular. Angles along the circumference, or hexagonal, octagonal, square, or rectangular poles or mast arms shall not be permitted.

Ten-foot and fifteen-foot pedestal type signal poles shall be capable of supporting a signal head using a standard pole top mount.

4.2 Signal Mast Arms

Traffic signal mast arms will be furnished with end caps. If, while being installed, an arm needs to be shortened, the Contractor must fabricate and install a new end cap.

4.3 Luminaire Mast Arms

Luminaire mast arms furnished by the Owner will be of the single arching type. Typically, the length will be either 12 feet or 15 feet.

4.4 Pole Foundations

Contractor shall be responsible for all labor and materials required for foundation installation, including rebar cages. Foundations shall be Portland Cement concrete conforming to the applicable requirements of Class BZ, as referenced in the SSRBC.

The bottom of concrete foundations shall rest on firm ground. Foundations shall be poured monolithically. For poles or pedestals, the top 4 inches shall be poured after the pole or pedestal is in proper position. The exposed portions of the foundation shall be formed to present a neat appearance.

Tops of foundations except as noted on the plans, shall be finished to curb or sidewalk grade, or as indicated in the plans. Forms shall be rigid and securely braced in place. Conduit ends and anchor bolts shall be placed in proper position and to proper height and shall be held in place by means of a template until the concrete sets.

Both forms and ground, which will be in contact with the concrete, shall be thoroughly moistened before placing concrete.

Where obstructions prevent construction of the planned foundation, the Contractor shall construct an effective foundation as directed by the Owner.

Traffic signal poles with mast arms greater than 70-feet shall use CDOT's 75-foot mast arm caisson specification per S-614-40 Typical Traffic Signal Installation Details for caisson diameter and depth only.

Mast arm poles shall be installed with the proper rake as recommended by the manufacturers of the poles so as to assure a substantially vertical set when the specified signal and lighting equipment is installed.

Anchor bolts for the mast arm poles will be supplied by the Owner to the Contractor. Anchor bolts shall conform to Subsection 715.02 of the SSRBC and shall be provided with two washers and two nuts and covers each. Plumbing the pole shall be accomplished by adjusting the nuts before the foundation is finished to final grade. Shims or other similar devices for plumbing or raking will be permitted only when approved by the Owner.

The excavation required for the installation of pole foundations shall be performed in such a manner as to avoid any unnecessary damage to streets, sidewalks, landscaping, utilities, and other improvements. Excavation shall be performed immediately before the installation of the concrete foundation. The material from the excavation shall be placed in a position that will not cause damage or obstruction to vehicular and pedestrian traffic or interfere with surface drainage.

Foundation holes excavated and not filled with concrete immediately shall be covered with a solid non-breaching surface covering and barricaded until concrete is poured. Foundation holes shall not be drilled more than 24 hours prior to placement of concrete without permission of the owner.

4.5 Protective Coatings for Signal Poles with Mast Arms and Pedestal Poles

4.5.1 Scope

Specification sections 4.4.2 through 4.4.11 are for the signal pole with mast arms being provided by the contractor and for the contractor's information when the signal pole with mast arms is Owner supplied. The specification is designed for the use of Valmont triglycidyl isocyanurate (TGIC) or super durable polyester powder (part number 250257 for mocha brown or 349235 for beige) or approved equivalent in conjunction with Valmont dark gray high build epoxy powder (part number 347380) or approved equivalent for the protection and finish of the tapered and non-tapered colored steel poles. Interior surfaces shall be prime painted by dip or spray.

4.5.2 General

In order to be acceptable, poles and component parts furnished on the project by the Contractor shall be in accordance with the terms and requirements set forth herein. Other comparable coating systems that comply with these specifications may be acceptable, subject to approval by the Owner. The Contractor shall be required to furnish the City with a notarized certificate of compliance from the pole manufacturer that guarantees that the coating system used is in conformance with these specifications and is free of defective workmanship.

4.5.3 Surface Preparation for Exterior Protective Coating Systems

Exterior surfaces of shaft and arm(s), and component parts shall be abrasive blasted in accordance with coating manufacturer's recommendations. Rolled-in mill scale, impurities, and non-metallics shall be removed. The lower interior portions of the shaft, from the base plate to the top of the handhole opening, shall receive the same treatment. Rough and sharp edges shall be rounded off. Weld splatter, flux, and slag around the base plate, handhole, arm connections and other areas of welding shall be removed. Drilling of holes and welding of tenons or hubs shall be done prior to abrasive blasting.

4.5.4 Requirement of Interior Protective Primer System

The interior surface of the pole shaft shall be thoroughly cleaned, dried, and free of mill scale, rust, oil, grease, and dirt, or other contaminants before interior primer is applied. Primer shall conform with Federal Specification TTP-645, yellow or red oxide. Minimum dry film thickness shall be two and one-half (2-1/2) mils.

4.5.5 Requirement of Exterior Protective Coating System

After abrasive blast, exterior steel surfaces shall hot dip galvanized in accordance with ASTM A123. All threaded holes shall be plugged prior to galvanizing. All holes shall be free of excess galvanizing. Galvanized steel surfaces shall be kept indoors and free from moisture and other foreign materials prior to prime painting. Prior to powder coating, poles, mast arms, and luminaire arms shall be brushblast to a uniform dull appearance from of any shine and preheat. Mechanically galvanized parts do not require brushblast.

After exterior steel surfaces have been galvanized, an epoxy prime coat consisting of Valmont dark gray high build epoxy powder (part number 347380) or approved equivalent shall be applied. A minimum dry film thickness for the high build epoxy powder of five (5) mils shall be required for the bottom eight (8) feet of the pole. A minimum dry film thickness of three (3) mils shall be required for the remaining surfaces of the pole above eight (8) feet and mast arms and luminaire arms. Metal cure temperature shall be 300 degrees Fahrenheit.

The color topcoat shall consist of two (2) coats of Valmont triglycidyl isocyanurate (TGIC) or super durable polyester powder (part number 250257 for mocha brown or 349235 for beige) or approved equivalent at a minimum of one and one-half (1.5) mils dry film thickness for a total minimum dry film thickness of three (3) mils. The total exterior coating system shall consist of a minimum of eight (8) mils dry film thickness for the bottom eight (8) feet of the pole and a minimum dry film thickness of six (6) mils for the remaining surfaces of the pole above eight (8) feet and mast arms and luminaire arms. The coating shall form a satin finish with lasting color, resistant to fumes, splash and spillage of acids and alkalis.

The primer and topcoat for exterior application shall be supplied by the same manufacturer to ensure a compatible protective coating system resistant to corrosion, abrasion and impact.

Color for finish topcoat shall conform to City requirements. Color shall meet Federal Standard 595C Colors (January 2008). Color number 10075, satin finish "Mocha Brown", or Color 20227, semi-gloss finish "Beige". Beige shall only be used if specified on the plans.

4.5.6 Application

The prime coat and color topcoat shall be strictly applied according to manufacturer's recommendation. The lower interior portion of the shaft, from the bottom of the base plate to the top of the handhole opening, shall receive the same application treatment. Surfaces shall be kept free of moisture, oil, grease and other organic matter until coated. Failure to do so will prevent proper adhesion and shall require the abrasive blast procedure to be repeated. Solvent wiping is not satisfactory as contamination may be spread and not be removed. Prior to applying top coat, repair any surface imperfections such as sags or runs by light sanding to obtain a uniform surface. Apply prime paint as necessary to any voids or areas having less than the required thickness. Powder application shall be with electrostatic spray equipment.

4.5.7 Drying and Curing Time

Drying time for the application of each primer coat and color topcoat application shall be per the coating manufacturer's specifications.

Curing time after final color topcoat and prior to packaging, loading and shipment shall be per the coating manufacturer's specifications to ensure complete dry-through time.

4.5.8 Wrapping and Packaging

Upon completion of the coating system, and prior to shipment, poles and arms shall have protective wrapping with two (2) inch minimum overlap applied at contact points with cushioned dunnage during transport. This wrapping shall be cushioned material, be a minimum one-eighth (1/8) of an inch thick and twenty-four (24) inches wide, be applied at contact points, and extend a minimum of eighteen (18) inches on either side of dunnage locations at poles and arms. Minimum thickness of wrap shall be three-eighth (3/8) of an inch at contact points. Component parts shall be individually wrapped with heavy kraft paper and boxed for shipment.

4.5.9 Handling and Shipment

Poles, Mast Arms, and luminaire extensions and arms shall be handled in a manner that will preserve the overall appearance and prevent damage to the coating. The use of chains or cables for loading, unloading, shipping or installing is prohibited. Only 3/4-inch diameter or larger nonabrasive nylon rope or equivalent nylon belting will be used. Adequate hold-downs and appropriate blocking shall be utilized for shipping to prevent load movement and damage to the outer coating in transit. No handling should be allowed until dry-through condition has been achieved with the coating.

4.5.10 Delivery, Installation and Acceptance of Poles

Extra care will be taken not to damage the coating. Upon arrival of the poles at the delivery point, neither chains nor cables will be used for either unloading or installation of poles.

Mast arms shall not be installed so as to block visibility of existing span wire mounted signal heads. If pole locations require mast arms to be located in front of span wire mounted heads, the arm shall not be installed until the span wire, and signal heads are removed. The mast arm shall be pre-wired on the ground prior to completed installation to hasten installation time in this instance.

4.5.11 Procedure for Field Touch-Up

The Contractor will furnish extra paint, both primer and color coat, to satisfy the needs of field touch-up requirements in the event of minor physical damage to the coating from handling or transit. Damaged area must be clean and dry before repair application. Field touch-up will be at the direction of the Owner and the pole manufacturer or his authorized representative.

4.7 Owner Supply

Traffic signal poles, mast arms, luminaire extensions, and luminaire arms will be provided by the City of Thornton Traffic Engineering. No submittals are required.

SECTION 5

CONDUCTORS AND CABLES: SIGNAL WIRING

5.0 General

Aerial cable shall be installed where specified on the plans and secured to messenger cable with cable ties or rings. No self-supported cable shall be installed unless that cable is specifically designed for this purpose. Drip loops shall be provided on all conductors where they enter pole weatherheads or signal heads.

Conductors shall be permanently identified as to function. Identification shall be placed on each conductor, or each group of conductors comprising a signal phase, in each pull box and near the end of terminated conductors.

Identification shall be by bands fastened to the conductors in such a manner that they will not move along the conductors.

All cables and conductors not shown on the plans as aerial cable or imbedded loop detector shall be installed in conduit unless installed in poles, pedestals, or mast arms.

5.1 Codes

Grounds and bonding wire, straps, and electrodes shall conform to NEC Article 250.

Wiring and splices shall conform to appropriate article of the Code. Wiring within cabinets, hand holes, junction boxes, etc., shall be neatly arranged and shall be laced.

Conductors shall be stranded, tinned copper wire, rated at 600 volts and individually insulated with heat stabilized polyethylene. Conductors and cable shall conform to IMSA Specification 19-1.

5.2 Bonding and Grounding

Metallic cable sheaths, conduit, metal poles, and pedestals shall be made mechanically and electrically secure to form a continuous system and shall be effectively grounded. Bonding and grounding jumpers shall be a bare copper wire or copper strap of the same cross sectional area, No. 8 AWG, for all systems. Sheath for detectors shall be grounded in control cabinet only. The other end of the sheath shall be taped and left ungrounded.

Bonding of poles and pedestals shall be by means of connecting to the ground rod a bonding strap attached to an anchor bolt or a 3/16-inch or larger brass or bronze bolt installed in the lower portion of the shaft.

A ground electrode shall be installed at each control box. Each ground electrode shall be one-piece copper-weld rod of 5/8-inch diameter and eight-feet in length, driven to a depth of at least 8 feet below the surface of the ground (top of rod flush with ground or top of cabinet base).

The ground terminal of controller shall be connected to the ground rod with a No. 8 AWG bare copper wire with an approved ground rod clamp.

5.3 Wire Splices

Splices shall be made in the handholes or cabinet. No splices shall be allowed in pull boxes or conduit unless authorized by the Owner. Method of splicing must be approved by Owner.

5.4 Installation

Sufficient signal light conductors shall be provided to perform the functional operation of signal system. Twenty-one (21) conductor cable shall be run to each signal pole. Seven (7) conductor cable shall be run from the handhole of each signal pole to each signal head. A minimum of three (3) spare conductors per through phase shall be provided throughout the signal light circuit. Additional conductors for service, interconnect, etc., shall be provided as noted on the plans.

Signal light conductors shall conform to the red-yellow-green color sequencing with different colored tracers for each phase provided.

All signal light cable conductors shall have individual terminal lugs for connection to terminal strips in cabinet.

Neutral conductors shall be individually landed on the neutral bus in the traffic signal controller cabinet. Grouping or splicing together of neural conductors prior to landing on the neutral bus shall not be permitted.

When conductors and cables are pulled into the conduit, the ends of all these conductors and cable shall be taped to exclude moisture and shall be so kept until the splices are made or terminal appliances attached. Ends of spare conductors shall be taped to exclude moisture.

Powdered soapstone, talc, or other approved lubricant shall be used in placing conductors in conduit.

Pull rope - (1/4 inch nylon rope) shall be installed in all new conduit and all existing conduit where a cable is added or an existing cable is replaced. At least two feet of pull rope shall be doubled back into the conduit at each termination.

Five feet of slack shall be left for each conductor at each support pole and two feet of slack at each pull box containing cable connections.

At least two feet (2') of slack for both power feed and loop wire is to be provided in each pull box so that testing and splicing can be done outside the pull box.

Splicing of cable will not be permitted in the conduit or outside of pull boxes, standards, or at the hand hole location in pedestals unless authorized by the Owner.

Multi-conductor cable shall be spliced and insulated to provide a watertight joint to prevent absorption of moisture by the cable.

Three-pair Belden twisted cable shall be used for pedestrian push buttons. Each pair shall be individually twisted and shielded 18 gauge stranded wire. The cable shall have polyethylene outer insulation and shall conform to IMSA specification 50-2, Belden part # YC47326 or approved equal. The three pairs of conductors shall be colored white/black, red/black, and green/black. The white/black pair shall be used for eastbound and westbound pedestrian movements. The red/black pair shall be used for northbound and southbound pedestrian movements. The green/black pair shall be spare conductors.

The power feed for the traffic signal controller cabinet shall be continuous without splicing from the power source to the meter, from the meter to the circuit breaker, and from the circuit breaker to the traffic signal controller cabinet. A second power feed for the

illuminated overhead signage and luminaires shall be continuous without splicing from the meter to the circuit breaker, and from the circuit breaker to the home run pull box. From the home run pull box, the power feed for the illuminated overhead signage and luminaires shall be split through the use of a URD submersible bus type connector, with separate conductors run to the base of each traffic signal pole. Additional URD submersible bus type connectors shall be used in successive pull boxes that serve more than one traffic signal pole. From the base of each traffic signal pole, the power feed shall be split, with separate conductors run to the luminaire and to the illuminated overhead signage. Daisy-chaining of the conductors shall not be permitted.

5.5 Meter

The Contractor shall install a meter housing as required for the project. The Contractor shall intercept the existing power feed to the Birch Dr. cabinet and route through new electrical meter providing a metered power source to the cabinet. Meter housing shall be a bare aluminum Myers Power Products Inc. MEUG3A-12 series, Milbank U5949 Cold Sequence Meter Main Pedestal, or approved equal. The anchor bolt and foundation design for the Myers Power Products Inc. MEUG3A-12 Series meter housing shall be per manufacturer's recommendation. Concrete for the foundation shall be Class BZ per Colorado Department of Transportation SSRBC, latest revision. The contractor shall coordinate with the relevant electrical service provider on the source and connection of the power feed, the installation of the meter in the meter housing, and the connection of the power feed to the meter. Within Xcel Energy territory, the contractor shall coordinate with Xcel Energy to obtain the MI rate for traffic signal electrical service. The contractor shall zip tie all doors on the meter housing that can be padlocked. Padlocks shall not be used.

SECTION 6 VEHICLE DETECTION

6.0 General

Vehicle detection shall be video or loop as shown on the plans unless otherwise authorized in writing by Owner's Traffic Engineer.

Traffic signal equipment shall be designed to operate between an ambient temperature of minus thirty degrees Fahrenheit to plus one hundred sixty-five degrees Fahrenheit with a relative humidity up to ninety-five percent.

The video detection system (VDS) shall consist of up to four video cameras, up to two digital video processors (DVP) capable of processing up to two video sources each, one 19" rack mounted Central Control Unit (CCU), video surge suppressors and a pointing device.

The system shall include software that discriminately detects the presence of individual vehicles and bicycles in a single or multiple lanes using only the video image. Detection zones shall be defined using only an embedded software application. A monitor, a keyboard and a pointing device are used to place the zones on a video image. A minimum of 32 detection zones per camera view shall be available. A separate computer shall not be required to program the detection zones. In addition to creating vehicle and bicycle zones, the system shall automatically define a pedestrian crossing area in front of the stop bar zones. The system shall provide a tracking mechanism that counts pedestrian volume moving within this crossing area, and also determine the average, maximum, and minimum speed of pedestrians moving within this crossing zone. The system shall also provide discrete outputs when pedestrians are in the crosswalk during normal crossing phases and when a red phase input has been detected. The system shall also provide a visual indication on the video image that a pedestrian is in the crosswalk.

6.1 Installation

6.1.1 The DVP shall be a single-rack detector card width and provide provision for up to two sensors per VDP. It may be possible for the VDPs to be embedded in the shelf-mount CCU to provide a single cabinet interface.

Each DVP will be supplied with video from the VDS Camera Sensor via Ethernet cables plugged into the front of the Central Control Unit. The interface connectors shall be RJ-45 type.

The CCU shall provide four ports for connection to VDS camera sensors. The connector shall be an RJ-45 type.

An Ethernet communications port shall be provided on the front panel. The Ethernet port shall be compliant with IEEE 802.3 and shall use a RJ-45 type connector mounted on the front panel of the CCU. The Ethernet communications interface shall allow the user to remotely configure the system and/or to extract calculated vehicle/roadway information. The interface protocol shall be documented, or interface software shall be provided. Each VDS shall have the capability to be IP addressable. The VDP shall support data rates of up to 100Mbps.

The CCU shall provide an SDLC connection to the Traffic Controller. The connector shall be a 'D-15' type, in compliance with NEMA TS-2 specifications.

The VDS camera sensor shall utilize a single shielded CAT5E or CAT6 cable for power and video. Cable termination at the camera shall not require crimping or special tools. The cable termination shall only require a standard wire stripper and a screw driver. No connectors (e.g. BNC) shall be allowed.

The camera imager shall employ wide dynamic range (WDR) technology to compensate for wide dynamic outdoor lighting conditions. The dynamic range shall be greater than 100 dB.

The VDP and CCU shall be Iteris Vantage Next WDR or approved equal.

6.1.2 The video detection system shall be installed by factory certified installers and as recommended by the manufacturer and documented in the installation materials. If to be mounted on the mast arm the bracket shall be a PELCO #AB-0170-74 with stainless steel straps (not cables), or approved equivalent, minimum 74 inches in length.

6.2 Contractor Supply

Video detection will be provided by the Contractor.

SECTION 7 PUSH BUTTON STATIONS

7.0 General

Pedestrian detection is accomplished by the push button stations.

Pedestrian push buttons shall be of the direct push button contact type and shall be black Polara iNS3 iNavigator 3-Wire Push Button Station or approved equal. The push buttons shall operate on a voltage not to exceed 18V AC. The assembly shall be of tamper-proof design and equipped with a push button instruction sign. Button frames shall be painted black and ADA approved.

The assembly shall be weatherproof and constructed so it shall be impossible to receive any electrical shock under any weather conditions.

The pedestrian push button instruction sign shall be MUTCD R10-3b 9"x12" and include informational text as shown in the detail sheets in the plans.

Sign dimensions shall conform to mounting frames as shown in the detail sheets in the plans.

7.1 Contractor Supply

APS push buttons and instruction sign will be provided by the Contractor.

SECTION 8 SIGNAL HEADS

8.0 General

Signal equipment shall be manufactured and be designed to operate from a 115 volt 60 cycle single-phase source.

All traffic signal equipment shall be designed to operate between ambient temperatures of -30 degrees F to +165 degrees F, with relative humidity up to 95 percent.

Twelve (12) inch signal heads shall be polycarbonate and shall come complete with mounting opening plugs, washers and gaskets for mounting. Heads shall be highway signal black in color (both faces and housings). Visors shall be polycarbonate and shall be highway black for outside and flat black inside. LED arrows shall not be the outline type.

All signal faces installed prior to final activation of the system shall be covered with orange bags to clearly indicate that the signal is not operational. The covering shall be over the entire head and shall be securely fastened. No adhesive used to secure the head covering shall touch any part of the head or mounting assembly. Signal heads and faces shall not be installed sooner than five (5) days prior to activation, unless approved in writing by the Owner.

All signal hardware to be furnished under this contract shall be of standard design and manufacture. No special fittings and/or components shall be used or furnished which are not shelf type items by the manufacturer and/or vendor.

All vehicle signal faces and pedestrian signal faces shall be of the adjustable, vertical type as shown on the plans. They shall provide light indication in one direction only and shall be adjustable through 360 degrees about a vertical axis.

All mast arm mounted heads shall be mounted at the location determined by the Owner. No holes shall be placed into the mast arms until actual head location has been determined in the field by the Owner.

All mast arm mounted heads shall be installed at a uniform elevation above the roadway surface.

Unless otherwise shown on the plans, traffic signal faces shall be standard 12-inch LED and shall contain three sections arranged vertically; red--top; yellow--center; green--bottom.

All vehicle signal faces shall be focused to allow maximum visibility to approaching motorists. All signal heads installed at any one intersection shall be of the same make and type, unless otherwise stated in the Schedule of Bid Items, or these Technical Specifications, or approved by the Owner.

8.1 General Standards

The signal housing and LED faces shall conform to the Institute of Transportation Engineers most recent standards. LED on-board circuitry must meet FCC Title 47, CFR Subparts B, Section 15.107, 109 regulations concerning emission of electronic noise. Certificate of Compliance with ITE standards shall be provided upon delivery of material.

8.1.1 Physical

The traffic signal housing shall be for direct LED use or be a retrofit LED in a traffic signal housing built to the ITE Vehicle Traffic Control Signal Head (VTCSH) standards without modification to housing or need of special tools. The lens, lamp module, and gasket shall be weather tight and fit securely in the housing and shall be Gelcore, Dialight, or approved equal.

8.1.2 LED Signal Lens Module

The lens may be uniformly tinted to enhance ON/OFF contrasts in a manner not to affect luminous intensity or chromaticity. The lens shall be easily replaceable in the field without the need of any special tools or any adhesives in the event of vandalism or vehicle impact. The lens shall be keyed to the housing to assure proper orientation. The lens material shall be Ultraviolet (UV) stabilized polycarbonate to withstand direct sunlight exposure for a minimum of five years without exhibiting evidence of deterioration.

8.1.3 Lamp Construction

The LED signal shall be a self-contained device not requiring on-site assembly and be capable of withstanding mechanical shock and vibration.

8.2 Mounting Hardware

8.2.1 Mast Arm Mounts

Signal head placement as shown on the plans are representative only. All mast arm signal head mounts shall be a Pelco Astro-Brac Tallon Series AB-0617 (no paint) with ninety-six inch (96" cable) or Sky Bracket type mount. Each head shall be mounted with a separate mount. Horizontal clustering of two arrowed heads next to a three section standard head will be permitted on one Sky Bracket type signal mast arm mount.

All pedestrian hybrid beacon (HAWK) mast arm and side of pole mounts shall be Sky Bracket HAWK Beacon Mount, part number SS-SB29-HPB-18 or approved equal.

8.2.2 Side of Pole and Top of Pole Mounts

One-way side and top mounts shall be aluminum and shall be highway black in color. The upper and lower arm assemblies for one-way side of pole mounts shall use elbows and not "T" fittings. Two-way side of pole mounts for signal and pedestrian signal heads shall be aluminum, and shall be highway black in color. Two-way side of pole signal head mounting assemblies shall use a "T" fitting in the center frame pipe. Elbows shall be used on the upper and lower arm assemblies at the signal head mounting locations.

8.3 Backplates

Backplates shall be furnished and installed on all overhead vehicular signal heads on mast arms. No background light shall show between the backplates and the signal face or between sections of the signal head.

Backplates shall be either all one piece or sectional. Sectional backplates shall be riveted together. No screws shall be allowed for putting backplates together. Backplates shall be 5 inches in width unless otherwise approved by the Owner and shall be louvered to allow airflow and yet not permit background light to be visible to the motorist. Backplates shall be aluminum painted Flat Black. Backplates shall be installed to the signal head using the appropriate screws and 1/4-inch zinc plated flat washers.

SECTION 9 PEDESTRIAN SIGNAL HEADS

9.0 General

All Pedestrian Signal Heads shall be polycarbonate 18-inch clamshell mounting type, (Portland Orange and Lunar White). Units shall be highway black in color. Units shall come complete with a combination cutout and/or honeycombed visors, to prevent sun washout. Units shall be LED with a Hand/Man and Countdown display.

SECTION 10
EMERGENCY VEHICLE PRE-EMPT DETECTION

10.0 General

Opticom No. 722 (Detector) (Global Traffic Technologies) units or approved equal shall be used for detection purposes, consisting of a dual channel, bi-directional assembly.

SECTION 11

CONTROLLER AND CABINET SPECIFICATIONS

11.0 General – Controller Specifications

The contactor shall install owner supplied Econolite Cobalt Rackmount LT controller with touchscreen and ASC3/LX firmware version 32.67.30 or later.

11.1 General – Cabinet Specifications

11.1.1 General

The contractor shall install owner supplied 333SD-ITS Cabinet with uninterrupted power supply.

Cabinets shall have the following items included in addition to the items specified for each cabinet.

1. The cabinet shall be natural aluminum with no anti-graffiti coating and no powder coating finish.
2. A means of selecting the active red monitor channel shall be provided on the rear of the monitor panel. Selection shall be accomplished by means of a two position jumper (shunt) with the center position wired to a red monitor input and select of 115V AC to the right and red load switch output to the left. Moving the jumper to the right will provide continuous red input and override, while moving a jumper to the left will attach the monitor channel to the corresponding load switch output.
3. This jumper assembly shall be accessible while the intersection is in operation. Means shall be provided to prevent shock to personnel operating jumper selection devices.
4. Red monitoring disable control shall be provided within the red monitor cable assembly. Pin six on TB02 shall connect to a 24V DC relay coil. This relay is designated RM control relay. The normally closed contacts shall provide 115V AC to the red monitor select line and pin 17 on the monitor cable. When a logic ground is applied to TB02-6 the RM relay shall energize and open the cable. The relay power will be derived from the cabinet 24 VDC cabinet power supply.
5. Each unit shall comply with the following:
 - a. Clamping level 400V peak normal mode and 500V peak common mode. Trace photos and other test related information will be available upon request.
 - b. EMI/EFI noise rejection derived via standardized 50 ohm insertion loss tests shall have amplitude of at least –20db over a minimum spectrum from 50 KHZ with a –40db being the most desirable.
 - c. Diagnostics indicators shall clearly display the status of the suppression circuit. The indication shall warn of the loss of protection.
 - d. Transient energy suppression shall be in excess of 250 Joules.
 - e. Rated voltage is 120V AC with rated output current minimum 10 amperes single phase operation.
 - f. All of the above components provided on the project, excluding the signal monitor unit, shall be on the Colorado and California Qualified Products listing.

6. The cabinet drawings shall be non fading prints using xerography method. No blue line drawings shall be acceptable.
7. Serial connections shall use a standard RJ – type quick lock connection.
8. One (1) Set of anchor bolts.
9. The cabinet shall include the following:

QUANTITY	ITEM
	Internal Fans – 2 for the 333SD-ITS, 1 for the 336S and 303 Cabinets
	Internal (front/back) fluorescent lamps - 4 for the 333SD-ITS, 2 for the 336S, 1 for the 303 Cabinets
4	Model 430” Transfer Relays
2	Model 204 2-Circuit Flasher (cube type, 25 AMP output)
12 maximum	Model 200 Load Switches w/Input & Output LEDs (cube type, 25 AMP)
3 maximum	Model 242 DC Isolators
*	Model 222 Loop Amplifiers or Video Detection Cards
1	Model 2010ECLip Monitor with absence of red monitoring
	New York 330 Pull-out Drawer Assembly – 2 for the 333SD-ITS, 1 for the 336S, and 0 for the 303 Cabinets
1	Transient Voltage Surge Suppression System
2	Split Input files – 333SD-ITS Cabinets only
1	Output File (not in the 303 Cabinet) with terminal strips (not Phoenix connectors)
8	Flash Program Blocks – 6 in the 303 Cabinet

* As required per plans.

11.2 333SD-ITS Cabinet Assembly

The 333SD-ITS Cabinet shall consist of the following in addition to Section 11.1:

The controller cabinet shall be a four door Model 333SD-ITS as specified. The 333SD-ITS cabinet shall include a base extension assembly. The input file shall meet the requirements of the split input file. Unless otherwise specified in the contract, the cabinet shall include the following:

Cabinet dimensions: 54” X 43” X 26” D

All four doors shall have Corbin #2 locks installed.

A minimum of 12 selections are required eight phase selections and four overlap selections shall be provided with jumper selections.

Split input file shall be an SF 170 that will also operate in the 332/336S cabinets.

The Split Input File shall use a split 22 pin connector (2 rows of 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 the older 2 and 4 channel devices available under the 170 and NEMA TSI specification as well as the newer 2 and 4 channel devices as specified in the TS2 NEMA specification.

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. All 14 slots shall be able to be tied to one common communication drop if desired.

The serial/ITL Transmit and receive pairs shall be wired across the back panel. TXO, DXO, Ground0 serve the first eight slots. TX1, DX1 and Ground1 serve the next six slots. Back plane 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 line low)

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

The left side of the 333SD-ITS cabinet assembly shall have shelves assembled to the EIA rack assembly to house additional equipment such as, but not limited to, Video Detection, Standby Uninterrupted Power supply and communication equipment.

Surge suppression for the field wiring shall be installed on the back of the output file.

The contractor shall install a beacon on the cabinet to provide visual alert should an uninterrupted power supply become active. The beacon shall be a 24 volt Whelen 2015HP yellow beacon, or approved equal, and shall be located in the top center of the cabinet. The beacon shall be wired to the cabinet and the uninterrupted power supply using 18 gauge wire. An outdoor silicone caulk bead shall be applied between the beacon and the cabinet to prevent water intrusion.

11.3 336S Cabinet Assembly

The 336S Cabinet Assembly shall consist of the following in addition to Section 11.1:

One (1) "M" base adaptor (attached) break-away type.

11.4 303/8 Cabinet Assembly

The 303/8 Traffic Signal Control Cabinet shall consist of the following in addition to Section 11.1:

Single door access
Side of pole mounting
Eight (8) slot input file.

11.5 Owner Supply

Controller and cabinet will be provided by the City of Thornton Traffic Engineering. No submittals are required. New signal shall connect and operate from existing cabinet and controller located at the intersection of 120th Avenue and Birch Drive.

SECTION 12 ILLUMINATED OVERHEAD SIGNAGE

12.0 General

All internally illuminated street name signs will be provided by the Contractor.

The internally illuminated signs shall be "Naim-Series-Inter Mark II" signs manufactured by NuArt Lighting, Fullerton, California, or standard (96" L x 19" H x 9.375" D) signs manufactured by Southern Manufacturing, Orlando, Florida, or approved equal. The internally illuminated signs shall be single or double faced as indicated on the plans with logo and guide. Some manufacturers fabricate standard sizes of those signs required on the plans. All signs on any single project shall be from the same manufacturer or fabricator. Signs shall be eight (8) feet in length.

The face of the panel shall be "Lexan" or an approved type of sufficient thickness to permit minimum deflection, as certified by the manufacturer. All faces shall be of the same material.

Colors for the sign faces shall be standard approved colors for highway signs. The colors may include white, green, blue, and red applied on the interior sign face. Green shall be Pantone 3435c Emerald Green (3M 3630-126). The City of Thornton logo shall be Pantone 300 Intense Blue (3M 3630-127). Blue for highway shields shall be Pantone 294 Bristol Blue (3M 3630-097). Red shall be Pantone 485 (3M 3630-33). Color tint shall show as intended and be consistent regardless of whether the sign is lit or unlit.

The sign layout shall include all necessary text and logos on one or both sides of the sign assembly as indicated on the plans.

The illumination source shall be light emitting diode (LED) and shall be from the same manufacturer or fabricator of the internally illuminated sign. The interval illumination shall provide a uniform lighting on the sign message and background. The light produced by the LED's shall not alter the colors or background on the signs faces.

Each sign shall have a plug-in type photo cell. Photo-electric controls are required and shall be of the "hail-resistant" type and meet the requirements of Section 15.1.4 Luminaire Photo-electric control.

An appropriately rated in-line fuse shall be installed at the base of the pole where the sign feed connects to the power feed.

The front sign panel of the cage shall be hinged, either by a continuous hinge or extruded interlocking hinge, to provide access to the internal components of the sign. A weather-tight gasket shall be provided all around the sign face to exclude dust and moisture. The latching devices shall be either screw type or latch type to provide a secure attachment of the sign face to the case. All exterior hardware, hinges, etc., shall be painted mocha-brown or beige, in accordance with Section 4.5 Protective Coatings for Signal Poles with Mast Arms and Pedestal Poles.

The sign case shall be securely attached to the support structure. Close coordination is to be maintained between the sign fabricator and support fabricator to assure all attachment devices are properly placed. The sign shall be hung using Pelco SP5559 brackets or approved equal.

A one-half ($\frac{1}{2}$) inch cord grip connector shall be installed where the illuminated street name sign wiring enters the signal pole.

One galvanized $\frac{1}{2}$ -inch eyebolt with washer and nut shall be installed adjacent to each mounting bracket for installation of safety cable. An outdoor silicone caulk bead shall be applied at the entrance of the eyebolt into the sign to prevent water intrusion.

12.1 Contractor Supply

Illuminated street name signs will be provided by the City of Thornton Traffic Engineering. No submittals are required.

Two safety cables per illuminated street name signs shall be furnished and installed by the contractor.

SECTION 13 STREET LIGHTING

13.0 General

This work shall consist of the furnishing and installation of street light poles, luminaires, and foundations in conformance with the plans. All work shall be done in accordance with these specifications, the National Electrical Code, and in conformity with the details as shown in the plans. The luminaires shall be EOI CRLS-A24-L120-UD-3M-30-GY-10V-7R-4B manufactured by Excellence Opto. Inc. (EOI) or approved equal. Ripley 6390LL-BK long life LED photocell or approved equal shall be incidental to the luminaire.

- Light Distribution: Type III
- Color Temperature: 3000K
- Lumen Pack: L120
- Flux: 88W
- LPW: 133
- BUG Rating: B2-U0-G2
- Paint: Gray
- Controls: 7R-7-pin PCR

13.1 Contractor Supply

Luminaires will be provided by the Contractor.

SECTION 14

GLOBAL POSITIONING SYSTEM

14.0 General

North American Datum 83 (NAD83) Colorado State Plane Central Zone coordinate system (grid) units in feet shall be provided for all roadway devices within the project limits. This shall include traffic signal controller cabinets, sign posts, pull boxes, water valve type pull boxes, traffic signal poles, pedestal poles, and street light poles. The elevation datum shall be based upon the North American Vertical Datum 1988 (NAVD 88).

14.1 Data Format

The GPS data collected shall be provided to the City in an AutoCAD drawing format using model space or using the GPS Device Installation form in Appendix C. The use of AutoCAD drawings or the GPS Device Installation Location form in Appendix C shall be at the discretion of the Traffic Engineer. If AutoCAD drawings are required, the drawings shall include a note describing how the coordinates were established along with the primary control points that were used. The AutoCAD information shall also be incorporated into the as-builts for the project.

The horizontal and vertical positional accuracy of the data collected shall be within a tolerance of ± 0.3 feet.

SECTION 15
Project Special Provisions

City of Thornton
120th Avenue & Northaven Circle Signal Design
Project No. SHO M286-050

The Colorado Department of Transportation 2023 Standard Specifications for Road and Bridge Construction controls construction of this project. Where applicable, the City of Thornton Standards and Specifications for the Design and Construction of Public and Private Improvements shall supplement the CDOT specifications. The following special provisions supplement or modify the Standard Specifications and take precedence over the Standard Specifications and plans.

In addition to requirements of the Colorado Department of Transportation Standard Specifications for Road and Bridge Construction, and the Contract Documents, all material and work shall conform to the requirements of the Standards of the American Society for Testing and Materials (ASTM), the American Standards Association (ASA), and any local ordinance which may apply.

Reference to any portion of the City of Thornton Standards and Specifications for the Design and Construction of Public and Private Improvements contained herein shall imply precedence over the CDOT Standard Specifications and Plans and shall be the requirement.

PROJECT SPECIAL PROVISIONS

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**COLORADO DEPARTMENT OF TRANSPORTATION
SPECIAL PROVISIONS
STANDARD SPECIAL PROVISIONS**

Name	Date	No. of Pages
Revision of Section 101 – Definitions and Section 106 – Control of Materials	(January 8, 2024)	2
Revision of Sections 101 and 106 – Buy America and Build America, Buy America Requirements – No-Federal Aid	(January 8, 2024)	4
Revision of Section 103 – Colorado Resident Bid Preference	(October 1, 2023)	1
Revision of Section 105 – Control of Work	(October 1, 2023)	1
Revision of Section 105 – Dispute Review Board and Claims for Unresolved Disputes	(October 1, 2023)	9
Revision of Section 107 – Water Quality Control (Under One Acre of Disturbance)	(October 1, 2023)	9
Revision of Section 109 – Prompt Payment (Local Agency)	(October 1, 2023)	2
Revision of Section 208 – Erosion Control (Under One Acre of Disturbance)	(October 1, 2023)	38
Revision of Section 601 – Structural Concrete	(October 1, 2023)	5
Affirmative Action Requirements Equal Employment Opportunity	(October 1, 2023)	13
Certified Payroll Requirements for Construction Contracts	(October 1, 2023)	1
Disadvantaged Business Enterprise (DBE) Requirements	(October 1, 2023)	15
Minimum Wages, Colorado, U.S. Department of Labor General Decision Number CO20240006 MOD 3, Highway Construction for Adams, Arapahoe, Broomfield, Clear Creek, Elbert, Gilpin, Jefferson, and Park counties.	(January 5, 2024)	10
On the Job Training	(October 1, 2023)	6

NOTICE TO BIDDERS

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

Pursuant to Subsections 102.04 and 102.05, it is recommended that bidders on this project review the work site and plan details with an authorized City of Thornton representative. Prospective bidders shall contact one of the following listed authorized representatives at least 24 hours in advance of the time they wish to go over the project.

Contracts Administrator

Keith Griess
9500 Civic Center Dr.
Thornton, CO 80229
Telephone: 303-538-7643
Email: keith.griess@thorntonco.gov

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

All questions shall be directed to the Thornton contacts listed above no later the date and time listed in the Request for Bids.

**COMMENCEMENT AND COMPLETION OF WORK
(WORKING DAYS)**

The Contractor shall commence work under the Contract within ten (10) calendar days of “Notice of Award” and the Contractor shall complete all work within 45 working days in accordance with the “Notice of Award”.

The Contractor shall complete work as follows:

All field construction work, including the construction of all infrastructure including traffic signal poles and mast arms, electrical conduit, electrical power cable, video detection equipment, sidewalk panel replacements, etc. at the locations listed in the plans shall be completed within 45 working days in accordance with the “Notice to Proceed”. A “punch list” of items to be completed as part of the mandatory project walk-through inspection must be completed in advance of the 45 working days timeframe and all “punch list” items shall be completed by the end of the 45 working days.

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

Subsection 108.03 shall include the following:

Salient features for this project are:

1. Traffic Signal Poles and Mast Arms
2. Traffic Signal Equipment
3. Sidewalk Panel Replacements
4. Traffic Signal Conduit and Wiring
5. Pedestrian Pedestal Poles

Revisions to the salient features may be made with approval of the Project Engineer. All paperwork required by the City of Thornton shall be submitted prior to the beginning of the work.

END OF SECTION

DISADVANTAGED BUSINEES ENTERPRISE (DBE) CONTRACT GOAL

This is a federally-assisted construction project. As described in the CDOT DBE Standard Special Provision, the Bidder shall make good faith efforts to meet the following contract goal:

10 Percent DBE participation.

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: 0 hours

**REVISION OF SECTION 101
DEFINITIONS AND TERMS**

Section 101 of the Standard Specifications is hereby revised for this project as follows:

Section 101 shall include the following:

The following Subsections are hereby amended to include the following:

- 101.28 Department** – City of Thornton Traffic Engineering Division
- 101.29 Engineer** – The City Engineer for the City of Thornton, acting either directly or through an authorized representative who is responsible for engineering and administrative supervision of the project. Chief Engineer shall also be defined as the City Engineer of the Department.
- 101.48 Pre-Construction Conference** – A meeting of City project personnel, Contractor project personnel and other stakeholders held prior to the beginning of construction at which topics pertinent to the successful prosecution of the work are discussed.
- 101.51 Project Engineer** – The City of Thornton’s Engineer directly responsible for the overall administration of assigned construction projects. Only the City of Thornton Project Engineer can approve and sign vouchers for the interim and final Contractor pay estimates or sign and authorize changes to the Contract if the Project Engineer is a Consultant Employee.
- 101.58 Regional Transportation Director** – The City Engineer for the City of Thornton, acting either directly or through an authorized representative who is responsible for engineering and administrative supervision of the project.
- 101.76 State** – The State of Colorado or the City of Thornton acting through its duly authorized representatives.

Subsection 101.73 paragraph a) is hereby amended to include the following:

When specifically referenced in these documents, the Standard Specifications shall also include the current City of Thornton *Standards and Specifications for the Design and Construction of Public and Private Improvements*.

END OF SECTION REVISION

**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 vegetation) in this area. Specific areas of vegetation to be protected shall be as directed by the Engineer and shall be protected by using orange construction fencing, wire fencing with metal posts or silt fence. 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 Contractor shall pay any fines or jail time should a wetland be damaged, at no cost to the project. 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

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 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.

END OF SECTION REVISION

**REVISION OF SECTION 108
PROSECUTION AND PROGRESS**

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

Subsection 108.03 shall include the following:

The Contractor shall present a CPM schedule to the Project Engineer at least seven calendar days prior to the preconstruction conference. This schedule shall show major features of each phase of the project for the entire project time frame.

Subsection 108.05 shall include the following:

The Contractor shall schedule all work between 7:00 A.M. and 7:00 P.M. Monday through Friday. Weekend and night work will be allowed with the prior written authorization of the Project Engineer. The Contractor may make emergency repairs to provide protection of the work and traveling public at any time. All on-roadway work or work that indirectly or directly interferes with the flow of traffic (vehicle, pedestrian, and bicycle) shall be in accordance with an approved Traffic Control Plan.

Meetings shall be required to review progress and to plan upcoming activities. Representatives from the Contractor and all active subcontractors shall attend the meetings. Such meetings will be required on a bi-weekly basis at a time to be determined by the City of Thornton and the Contractor. Additional meetings will be held when required by the City of Thornton or the Contractor.

The Contractor shall submit at the bi-weekly progress meetings a written statement of planned work activities and anticipated inspection and testing requirements of the upcoming week. A 24 hour notice shall be provided to the City of Thornton by the Contractor if the Contractor elects to change the planned work activities.

END OF SECTION REVISION

**REVISION OF SECTION 202
REMOVALS**

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

CONSTRUCTION REQUIREMENTS

Subsection 202.02 shall include the following:

Sidewalk panels to be removed shall be saw cut at the nearest joint. Removal operations shall not damage adjacent sidewalk panels not indicated for removal. If damaged, the concrete sidewalk panels shall be replaced to existing condition at no additional cost to the Owner.

BASIS OF PAYMENT

Subsection 202.12 shall include the following:

<u>Pay Item</u>	<u>Pay Unit</u>
Removal of Sidewalk	Square Yard

Payment includes all labor, equipment, and materials necessary to complete the work.

END OF SECTION REVISION

**REVISION OF SECTION 208
EROSION CONTROL MANAGEMENT**

Section 208 of the Standard Specifications is hereby revised for this project as follows:

Wherever Section 208 is in conflict with the City of Thornton Standards and Specifications, latest edition, the Thornton Standards or other standards referenced therein shall take precedence.

The term Sediment Control Log shall be considered equivalent with the term Erosion Log. The term Rock Sock shall be considered equivalent with the term Aggregate Bag.

END OF SECTION REVISION

**REVISION OF SECTION 212
LANDSCAPE RESTORATION**

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

Subsection 212.01 shall include the following:

This work consists of landscape restoration and removal and replacement of sod, small landscape rocks, and mulch in accordance with these specifications and in conformity with the lines and grades shown on the plans or established. Work is anticipated at northwest and southeast corners of 120th Avenue and Northaven Circle intersection surrounding the areas where signal poles are to be installed. Other minor landscape restoration may be needed at other corners of the intersection. This item includes restoration of landscape to its previous condition the intersection of 120th Avenue and Northaven Circle.

Add subsection 212.061 immediately following subsection 212.06:

Landscape Restoration includes but is not limited to removal of sod, small landscape rocks, and mulch and restoring disturbed areas with sod, mulch, and modifications to create a restored landscape. Landscape restoration also includes any necessary irrigation repairs or modifications. Contractor shall ensure a working irrigation system in locations where an existing sprinkler system is in place.

Subsection 212.07 shall include the following:

Landscape Restoration for the accepted complete restoration will be measured as a single lump sum and be paid at the completion of the work.

Subsection 212.08 shall include the following:

<u>Pay Item</u>	<u>Pay Unit</u>
Landscape Restoration	Lump Sum

**REVISION OF SECTION 217
NOXIOUS WEED MANAGMENT**

Section 217 of the Standard Specifications is hereby deleted and replaced with the following:

217.01 This work consists of furnishing and applying herbicides, providing mechanical and cultural controls to prevent or control plant growth in areas as shown on the plans or designated.

MATERIALS

217.02 All herbicide labels shall be currently registered with the Colorado Department of Agriculture and the U.S. Environmental Protection Agency. All herbicides shall be supplied to the project in labeled containers. The labels shall show the product name, chemical composition, expiration date, and directions for use.

CONSTRUCTION REQUIREMENTS

217.03 All herbicides shall be applied by a qualified applicator who is commercial pesticide applicators licensed by the Colorado Department of Agriculture as a qualified applicator. The Contractor shall furnish documentation of such licensing prior to herbicide application to the Engineer. Herbicide mixing and application shall be done in accordance with instructions on the registered product label. The Contractor shall furnish the Engineer such label information prior to mixing or application.

The Contractor shall notify the Engineer at least 24 hours prior to each herbicide application and shall indicate the time and location application will begin. Application will not be allowed on Saturdays, Sundays, or holidays unless otherwise approved by the Engineer.

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

Noxious weeds observed in and near the construction area will be spot 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

Herbicides shall not be applied when weather conditions, including wind conditions, are unsuitable for such work. Herbicides shall not be applied when soil is extremely dry.

Herbicide treatments shall avoid native flowering plants to minimize impacts to pollinators.

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.

Herbicide application method shall be such that plant growth outside the designated treatment areas will not be damaged. All damage caused by improper herbicide application shall be repaired at the Contractor's expense.

Noxious weed treatments shall target observed species and species listed in the in the Project Weed Management Plan Table 217.04. 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>

Project Weed Management Plan

Table 217.04

Noxious Weed	Plant Growth Characteristics	State List ¹	Recommended Treatments
Canada thistle (<i>Cirsium arvense</i>)	Aggressive rhizomatous perennial of moist/wet sites; seeds and plant parts easily transported by construction equipment.	B	<p>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.</p> <p>Herbicide Control: Aminopyralid (Milestone), Clopyralid + Triclopyr, Amiocyclopyracholor + chlorosulfur, or Picloram applied in spring before flowering and/or during fall regrowth.</p> <p>Cultural Control: Reseed with native seed mix and prevent bare ground.</p>
Field bindweed (<i>Convolvulus arvensis</i>)	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	<p>Mechanical Control: Cutting, mowing, or pulling is generally not effective.</p> <p>Herbicide Control: Clarity + 2,4-D Amine or Roundup Ultra applied at full-bloom and/or fall.</p> <p>Cultural Control: Reseed with native seed mix.</p>
Siberian elm (<i>Ulmus pumila</i>)	Fast growing tree distinguished by small toothed leaves about 1-2 ½ in long and pointed at the tip. Mature trees may reach a height of 50-70 feet. Spread primarily via seed; roots resprout when top growth is damage. Quickly outcompetes natives.	C	<p>Mechanical Control: Can be effective when combined with herbicide treatment. Seedlings can be grubbed with a shovel or other tool.</p> <p>Herbicide Control: Mid- to late summer foliar application of glyphosate or triclopyr are the most effective on Siberian elms less than 6 feet in height or on resprouts, but shall not be used where injury to nearby plantings may occur or within 30 days of planting nearby shrubs and trees. Cut-stump treatment with glyphosate is effective for larger individuals. Basal bark treatment using triclopyr can be highly effective for controlling smaller trees less than 8 ft tall with stems that are 2 to 3 inches in diameters.</p>

¹List 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.

Watch List Species have been determined to pose a potential threat to the agricultural productivity and environmental values of the lands of the state. The Watch List is intended to serve advisory and educational purposes only. Its purpose is to encourage the identification and reporting of these species to the Commissioner in order to facilitate the collection of information to assist the Commissioner in determining which species should be designated as noxious weeds.

Topsoil sources shall only have herbicides applied by the spot spray method.

METHOD OF MEASUREMENT

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

Reapplication of herbicide required due to inappropriate timing of the original application will not be measured or paid for.

BASIS OF PAYMENT

217.06 The accepted quantities of herbicide treatment will be paid for at the contract unit price per square yard or per hour.

Payment will be made under:

<u>Pay Item</u>	<u>Pay Unit</u>
Herbicide Treatment	Hour

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

Mowing, pulling, and bagging will not be measured and paid for separately but shall be included in the work.

Seeding shall be paid for according to 212 Seeding.

**REVISED 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 construction activity, including 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 or their nests protected by the Migratory Bird Treaty Act (MBTA). If construction activity is to occur between April 1 and August 31, then the following specifications must be followed and the Contractor shall retain a qualified wildlife biologist to determine where nest removal may occur or will be required during construction. 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 biologists' 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. If all construction activities occur after August 31 and before April 1, then the requirements set forth in this specification are not required.

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 will be submitted to the Engineer.

(a) *Vegetation Removal.* When possible, vegetation shall be cleared prior to the time when active nests are present. Vegetation removal activities shall be timed to avoid the migratory bird breeding season which begins on April 1 and runs to August 31. All areas scheduled for clearing and grubbing between April 1 and August 31 shall first be surveyed by the wildlife biologist within 50 feet of the work limits for active migratory bird nests. Contractor personnel shall enter areas 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 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 any tree or shrub removal or trimming.

If an active nest containing eggs or young birds is found, the tree or shrub containing the active nest shall remain undisturbed and protected until the nest becomes inactive. The nest shall be protected by placing fence (plastic) a minimum distance of 50 feet from each nest to be undisturbed. This buffer dimension may be changed if determined appropriate by the wildlife biologist and approved by the Engineer. Work shall not proceed within the fenced buffer area until the young have fledged or the nests have become inactive. If the fence is knocked down or destroyed by the Contractor, the Engineer will suspend the work, wholly or in part, until the fence is satisfactorily repaired at the Contractor's expense. Time lost due to such suspension will not be considered a basis for adjustment of time charges but will be charged as contract time.

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 wildlife biologist. This buffer dimension may be changed if determined appropriate by the wildlife biologist and approved by the Engineer. The Contractor shall install fence (plastic) at the perimeter of the buffer. Work shall not proceed within the buffer until the young have fledged or the nests have become inactive.

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

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

1. The Contractor shall remove existing nests prior to April 1.
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, the nests shall be removed before they are 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 $\frac{3}{4}$ inch by $\frac{3}{4}$ inch or less.

If an active nest becomes 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 Contractor's biologist and approved by the Engineer. The Contractor shall prevent construction activity from displacing birds after they have laid their eggs and before the young have fledged. If the project continues into the following spring, this cycle shall be repeated. When work on the structure is complete, the Contractor shall remove and properly dispose of netting used on the structure. 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 full compensation for all work and materials required to complete the item, including wildlife biologist, wildlife survey, and documentation (record of nest location and protection method).

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.

<u>Pay Item</u>	<u>Pay Unit</u>
Wildlife Biologist	Hour

**REVISION OF SECTION 625
CONSTRUCTION SURVEYING**

Section 625 of the Standard Specifications is hereby revised for this project as follows:

CONSTRUCTION REQUIREMENTS

Subsection 625.11 shall include the following:

The Contractor shall submit “as-built” drawings showing in detail all construction changes, including, but not limited to traffic signal cabinet locations and elevations, location and depth of conduit, pull box and all other installations and equipment that varies from the plans. As-built plans shall be electronic revisions of the construction plans. As-builts shall be submitted at the end of the project and shall be required prior to final acceptance by the City of Thornton. The preparation of “as-built” drawings, including all associated labor and equipment, shall not be paid for separately, but shall be incidental to the project.

END OF SECTION REVISION

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**REVISION OF SECTION 630
CONSTRUCTION ZONE TRAFFIC CONTROL**

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

DESCRIPTION

Subsection 630.01 shall include the following:

The City of Thornton Standards and CDOT Standard Specifications for Road and Bridge Construction, latest editions shall be utilized. Where those specifications and standards are in conflict with, the City Standards and Specifications shall take precedence.

The Contractor shall notify, at a minimum, City of Thornton Police Department, Thornton Fire Protection Agency, as well as City of Thornton Traffic Engineering when closures and detours are required.

Contractor shall maintain business, residential, and side street access at all times. This information shall be included in the MHT to be reviewed by the City of Thornton.

The Contractor shall provide the City 72-hour notice of any change in traffic control or detours.

Traffic control through the construction area is the responsibility of the Contractor. Before starting construction, the Contractor shall submit, in writing, the proposed Method of Handling Traffic (MHT) for the initial phase of construction. When a different MHT is required for a subsequent construction phase, it must be submitted two weeks prior to starting that phase. All proposed MHTs shall be approved, in writing, by the City of Thornton. No phase of construction shall start until an acceptable MHT has been received and approved by the City of Thornton. Submittal of MHT's shall not be paid for separately but shall be incidental to the work. The proposed methods shall include, as a minimum, the following:

A detailed diagram that shows the location of all sign placements, including advance construction signs (if not previously approved) and speed limit signs; method, length, and time duration for lane closures; and location of flag persons. A tabulation of all traffic control devices shown in the detailed diagram shall be included, but not limited to:

- Construction signs
- Portable message sign panels
- Advance warning flashing or sequencing arrow panel (Type C)
- Traffic cones

However, all devices required for any particular phase must be detailed and tabulated for each phase. Certain traffic control devices may be used for more than one phase of construction.

- Number of flag-persons to be used
- Number of days a Traffic Control Supervisor is to be required

All proposed MHTs shall be approved, in writing, by the City of Thornton. No Phase of construction shall start until an acceptable MHT has been received and approved by the Project Engineer.

Approval of the proposed MHT is intended to indicate those devices for which payment is to be made. Such approval does not relieve the Contractor of liability specifically assigned to him under the contract. The Contract shall erect and maintain warning lights, signs, barricades, and sufficient safeguards around all obstructions.

Signs damaged due to Contractor operations shall be replaced in kind or repaired by the Contractor at no additional cost to the project.

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**REVISION OF SECTION 630
CONSTRUCTION ZONE TRAFFIC CONTROL**

All advanced construction signing shall be installed prior to any construction activity and remain in place for all phases of construction. Road work advance sequence signs shall be reset as required to match current locations of initial traffic control devices.

Resetting of construction signs as required by the work is considered incidental to the project and will not be paid separately.

Masking of existing/permanent or temporary signs as required by the work is considered incidental to the project and will not be paid separately.

In the event the Contractor fails to complete the project within the allowable Contract time, including time extensions, the Contractor will bear all costs associated with the additional traffic control required by the project including all flagging, traffic control supervision, rental and maintenance of traffic control devices, etc. until the project is completed.

**REVISION OF SECTION 630
PORTABLE MESSAGE SIGN PANEL**

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

DESCRIPTION

Subsection 630.01 shall include the following:

This work shall consist of furnishing, operating, and maintaining portable message sign panels, to be on the project site at least two weeks prior to the start of active roadway construction.

MATERIALS

Subsection 630.03 shall include the following:

Portable message sign panels 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 LED legend or approved alternate, on a flat black background. LED signs shall have a pre-default message that activates before power failure. The sign shall have its own separate power source with independent back-up battery power. The sign shall be capable of 360 degrees horizontal rotation and be able to be elevated to a height of at least five feet above the ground surface as measured to the bottom of the sign. The sign should be visible from one-half mile under both day and night conditions. The message should be legible from a minimum of 650 feet. The sign shall automatically adjust its light source to meet legibility requirements during the hours of darkness. The sign enclosure shall be watertight and provide a clear polycarbonate front cover.

Message signs that are diesel generator powered shall be provided with a 20-gallon minimum capacity fuel tank. Solar powered message signs shall be capable of operating continuously for ten days without 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.

Flip disk legends shall have fluorescent ultraviolet black-light bulbs.

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

All electrical wiring including connectors and switch controls necessary to allow all sign functions required by the specification shall be provided with each sign.

Each sign shall include an operating and parts manual, wiring diagrams, and troubleshooting guide.

The portable message sign shall be capable of maintaining all required operations under Colorado mountain/winter weather conditions.

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

Each sign shall be wired with a 7-prong male electric plug for the brake light warning system. NAPA Part TC 6215 Trailer Connection or equivalent will be suitable to meet the requirements of this specification.

Subsection 630.17 shall include the following:

Maintenance, storage, operation, relocation to different sites during the project, and all repairs of portable message signs shall be the responsibility of the Contractor and will not be measured and paid separately.

BASIS OF PAYMENT

Subsection 630.18 shall include the following:

Payment will be made under:

Pay Item
Portable Message Sign Panel

Pay Unit
Each

END OF SECTION REVISION

FORCE ACCOUNT ITEMS

DESCRIPTION

This special provision contains the City of Thornton’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.

<u>Force Account Item</u>	<u>Estimated Quantity</u>	<u>Amount</u>
F/A Minor Contract Revisions	F.A.	\$ 10,000
F/A Erosion Control	F/A	\$ 5,000
F/A Relocate Irrigation Lateral	F/A	\$ 1,000

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

F/A Erosion Control - This work consists of minor erosion control 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 for this Contract.

F/A Relocate Irrigation Lateral – This work consists of minor irrigation lateral relocation work authorized and approved by the Engineer and City of Thornton’s Irrigation lead. This work is shown on the utility plans, but the extent of work is unknown and final location of the relocated line is to be determined in the field. This F/A item is necessary to accomplish the scope of work for this Contract.

END OF SECTION

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UTILITIES

The know utilities within the limits of this project are:

UTILITY COMPANY	CONTACT NAME EMAIL	PHONE
Adams 12 5-Star Schools - Fiber	Hallie Rogers hallie.rogers@adams12.org	Not Available
Adams County Comm Center Authority - Fiber	Scott Lane slane@adcom911.org	303-289-2235
AT&T Transmission - Fiber	Harvey Rosa hr8716@att.com	970-408-9110
City of Thornton - Fiber	Carlos Botello carlos.botello@thorntonco.gov	720-977-6487
City of Thornton – Water	Steve Crow steve.crow@thorntonco.gov	720-977-6553
City of Thornton – Sanitary Sewer	Justin Richardson justin.richardson@thorntonco.gov	720-977-6550
City of Thornton – Stormwater	Joe Romero joe.romero@thorntonco.gov	720-977-6392
City of Thornton – Irrigation	Matt Shutter matt.shutter@thorntonco.gov	303-255-7833
Comcast – CATV & Fiber	Brett Fields brett_fields@cable.comcast.com	720-670-0419
Lumen (CenturyLink) – Fiber & Telco	Luke Thompson Luke.Thompson@lumen.com	303-995-2859
MCI (Verizon) – Fiber	Lane Grady Lane.grady@verizon.com	303-827-9756
Xcel Energy – Electric & Gas	Patrick Quinn patrick.s.quinn@xcelenergy.com	303-425-3955
Zayo Bandwidth – Fiber	Eric Boe Eric.boe@zayo.com	719-649-3675

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.

All new underground facilities, including laterals up to the structure or building being served installed as part of this project must be electronically locatable when installed, in compliance with Colorado Revised Statutes, Title 9, Article 1.5.

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 below for necessary utility work elements. Provide an accurate construction schedule that includes all utility work elements to the owner of each impacted utility.

Provide each utility owner with periodic updates to the schedule. Conduct necessary utility coordination meetings and provide other necessary accommodations as directed by the Engineer. Notify each utility owner in writing, with a copy to the Engineer, prior to the time each utility work element is to be performed by the utility owner. Provide notice, as specified in Part 2, immediately prior to the time the utility work must begin to meet the project schedule.

Provide traffic control, as directed by the Engineer, for any utility work performed by the utility owner

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UTILITIES

within the project limits expected to be coordinated with construction. However, traffic control for utility work outside of typical project work hours or project limits shall be the responsibility of the utility owner.

Perform each utility work element for every utility owner listed in Part 1. Notify each utility owner at least 30 days 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. Obtain written acceptance from the utility owner for work performed by Contractor.

The Contractor shall verify the location and depth of existing facilities for potential utility conflicts, and coordinate with the utility owner if a relocation or adjustment to raise/lower lines is needed. If a conflict is determined, the Contractor shall expose the utility owner's line if requested by the utility owner so that the utility owner can relocate or adjust to raise/lower as needed. For relocations/adjustments that are expected to be done prior to construction, the Contractor shall coordinate with the utility owner regarding the status of the work and receive as-built information from the utility owner upon completion.

The Contractor shall verify with the utility owner if an abandoned facility has been abandoned prior to any removal work. The Contractor shall remove abandoned utility facilities as necessary to accommodate construction of proposed work.

The Contractor shall follow the utility standards of the Colorado Department of Transportation (CDOT) and the City of Thornton, as applicable. In cases where there are discrepancies between the standards the more stringent standard shall apply.

The Contractor shall protect in place all utility lines and appurtenances as noted on the plans.

Project Limits – All Utility Owners

Prior to excavation, drilling, or boring, the Contractor shall positively locate (through potholing if necessary) all potential conflicts with existing underground utilities and proposed construction, as determined by the Contractor according to proposed methods and schedule of construction. The Contractor may modify construction plans to avoid existing underground facilities if needed, but shall be approved by the Engineer.

Please note that UNCC marks only its members' facilities – other facilities, such as irrigation and drainage pipes may exist, and it is the Contractor's responsibility to investigate, locate, and avoid such facilities.

The Contractor shall verify the depth and location of all utilities that may be impacted by construction via potholing/test holes and coordinate with respective Utility Owners.

The Contractor shall contact each utility company a minimum of two (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 a need for utility work by either the Contractor or a Utility Company arises, 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 their facilities, so that each utility company can coordinate any needed locates, adjustments or inspections. The 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 not be paid for by the City of Thornton but shall be paid by the utility company requiring the work, unless otherwise agreed to in writing by the City of Thornton Engineer.

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UTILITIES

AT&T

The Contractor shall protect in place the existing fiber lines and shall abide by AT&T stand-by requirements. AT&T requires a 24 inch vertical clearance and their facility shall be discovered and verified prior to crossing.

City of Thornton

The Contractor shall relocate the irrigation lateral on the NE corner of the intersection of 120th Avenue and Northaven Circle. All work shall be coordinated with the City of Thornton's Irrigation lead and shall be completed to a satisfactory condition as determined by the City of Thornton Engineer or Irrigation lead. This work shall be paid for as Force Account item 700-70101 and shall include all labor, materials, and time to coordinate the work.

Comcast

The Contractor shall confirm utility relocation status with the Engineer prior to project commencement. Relocation of existing Comcast facilities is anticipated to be completed prior to construction of the City's project.

If relocation work has not been completed, then the Contractor shall coordinate with Comcast to have the fiber line relocated on the NE corner of the Northaven and 120th intersection, between fence and back of curb ramp or sidewalk. The Contractor shall provide a survey stake for proposed pedestal caisson location with caisson diameter and depth specified.

Xcel Energy

The Contractor shall confirm utility relocation status with the Engineer prior to project commencement. Relocation/removal of existing Xcel facilities is anticipated to be completed prior to construction of the City's project.

If relocation work has not been completed, then the Contractor shall coordinate with Xcel to have the secondary electric line relocated on the south side of 120th Avenue. The Contractor shall provide a survey stake for proposed caisson location(s) with caisson diameter and depth specified. The Contractor may relocate this line if Xcel grants permission, to prevent delay to the project. Any costs associated with this work shall not be paid for separately, but included in the work.

If removal work has not been completed, then the Contractor shall coordinate with Xcel and the City of Thornton to have the streetlight removed on the NW corner of the intersection of 120th Avenue and Northaven Circle, as shown on the plans.

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

Although the 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 or outside of project limits shall be the responsibility of the utility owner. The utility owner shall prepare and submit to the Engineer a Method of Handling Traffic for utility work to be performed outside typical project work hours or project limits. The utility owner shall obtain acceptance of the Method of Handling Traffic from the Engineer prior to beginning the utility work to be performed outside typical project work hours or outside of project limits.

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, and changes or new locations shall be coordinated with the Contractor and Engineer. Utility owners shall comply with schedule requirements of the Contractor and make every effort not to impact the overall construction schedule.

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UTILITIES

Utility owners shall follow the utility standards of the Colorado Department of Transportation (CDOT) and the City, as applicable. In cases where there are discrepancies between the standards the more stringent standard shall apply.

Utility owners are responsible for obtaining all necessary permits from the City of Thornton and CDOT, as required.

Comcast

Comcast to relocate the fiber line on the NE corner of the Northaven and 120th intersection, between fence and back of curb ramp and/or sidewalk.

Relocation of existing Comcast facilities is anticipated to be completed prior to construction of the City's project.

Comcast to coordinate with the Contractor if any additional facility is found to be in conflict. If a relocation or adjustment is necessary, Comcast to coordinate with the Contractor to schedule and facilitate the work. The work shall be done by Comcast forces.

Xcel Energy

Xcel to relocate the secondary electric line on the south side of 120th Avenue, where conflicting with caisson location(s). Xcel to remove the existing street light on the north west side of the project intersection, as shown on the plans.

Relocation/removal of existing Xcel Energy facilities is anticipated to be completed prior to or during construction of the City's project.

Xcel to coordinate with the Contractor if any additional facility is found to be in conflict. If a relocation or adjustment is necessary, Xcel to coordinate with the Contractor to schedule and facilitate the work. The work shall be done by Xcel forces.

GENERAL

Utilities are depicted on these plans in accordance with their achieved "Quality Level" as defined in the American Society of Civil Engineer's document ASCE 38, "Standard Guideline for the Collection and Depiction of Existing Subsurface Utility Data. Reliance upon these data for risk management purposes during bidding does not relieve the excavator or utility owner from following all applicable utility damage prevention statutes, policies, and/or procedures during excavation.

The Contractor shall comply with Article 1.5 of Title 9, CRS ("Excavation Requirements") when excavating 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 actual day of notice, prior to commencing such operations. The Contractor shall contact the Utility Notification Center of Colorado (UNCC) at phone no. 811 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 owner. Utility service laterals shall also be located prior to beginning excavation or grading.

The locations of utility facilities as shown on the plan and profile sheets were obtained from the best available information. No warranty is made for the adequacy or accuracy of subsurface information provided. The Contractor shall cooperate with the utility owners in their relocation operations as provided in subsection 105.11 of the Standard Specifications for Road and Bridge Construction. No guarantee is made that utility conflicts will be resolved prior to construction activities and any delays resulting from utility relocation work shall be dealt with in accordance with subsection 108.08 of the Standard Specifications for Road and Bridge Construction as amended.

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UTILITIES

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

END OF SECTION

APPENDIX A

GLOBAL POSITIONING SYSTEM (GPS) DEVICE INSTALLATION LOCATION

Date of GPS Locate:

Item Being Located – “Device”, “Pull Box”, etc:

Location of Item – “Street”, “Direction of Travel”, “Side of Street”, etc.:

North American Datum:

Northing _____
(based on NAD83 Colorado State Plane Central Zone Coordinate System)

Easting _____
(based on NAD83 Colorado State Plane Central Zone Coordinate System)

Vertical _____
(based on NAVD 88)

Remarks (primary control points used and how coordinates were established):

APPENDIX B

SUBMITTALS

The Contractor shall submit for review and approval the following list of equipment and materials as required by the plans, prior to the Contractor ordering such materials. Submittals shall consist of product cut sheets and necessary supporting material and each item shall be identified by the trade name, size, and catalog number. Additional documentation may be requested at the discretion of the Traffic Engineer.

- Concrete Mix Design (Class BZ)
- Concrete Mix Design (Class D)
- Conduit
- Conduit Coupler
- Emergency Vehicle Preemption
- In-line Fuse
- LED Luminaire
- Meter Housing
- Pull Boxes
- Pedestrian Push Button Station
- Pedestrian Signal Head (including mounting hardware)
- Pedestrian Signal Face
- Photocell
- Signal Head (including mounting hardware)
- Signal Indications
- Signal Backplate
- Vehicle Detection
- Wire (traffic signal conductors, pedestrian pushbutton. etc.)

APPENDIX C
QUANTITY TABULATIONS

NO.	ITEM DESCRIPTIONS	UNIT	QNTY	UNIT PRICE	AMOUNT
120th Avenue & Northaven Circle					
202-00009	Tree Trimming	LS	1	\$	\$
202-00200	Removal of Sidewalk	SY	21	\$	\$
202-00250	Removal of Pavement Marking	SF	14	\$	\$
203-01597	Potholing	HOUR	40	\$	\$
208-00035	Aggregate Bag	LF	60	\$	\$
208-00046	Pre-Fabricated Concrete Washout Structure (Type I)	EA	1	\$	\$
208-00053	Storm Drain Inlet Protection (Type I)(84 Inch)	EA	3	\$	\$
208-00106	Sweeping (Sediment Removal)	HOUR	24	\$	\$
212-01200	Landscape Restoration	LS	1	\$	\$
217-00020	Herbicide Treatment	HOUR	24	\$	\$
240-00000	Wildlife Biologist	HOUR	24	\$	\$
607-11525	Fence (Plastic)	LF	50	\$	\$
608-00006	Concrete Sidewalk (6 Inch)	SY	16	\$	\$
609-21020	Curb and Gutter Type 2 (Section II-B)	LF	19	\$	\$
613-00206	2 Inch Electrical Conduit (Bored)	LF	386	\$	\$
613-00306	3 Inch Electrical Conduit (Bored)	LF	700	\$	\$
613-07023	Pull Box (24"x36"24")	EA	3	\$	\$
613-10000	Wiring	LS	1	\$	\$
613-20200	LED Luminaire	EA	2	\$	\$
613-80130	Service Meter Cabinet	EA	1	\$	\$
614-00011	Sign Panel (Class 1)	SF	13.8	\$	\$
614-10130	Illuminated Sign	EA	3	\$	\$
614-70118	Pedestrian Signal Face (18)	EA	2	\$	\$
614-70336	Traffic Signal Face (12-12-12)	EA	9	\$	\$
614-70448	Traffic Signal Face (12-12-12-12)	EA	2	\$	\$
614-72860	Pedestrian Push Button	EA	2	\$	\$
614-72863	Pedestrian Push Button Post Assembly – 5 Foot	EA	1	\$	\$
614-72864	Fire Preemption Unit	EA	1	\$	\$
614-72886	Intersection Detection System (Camera)	EA	3	\$	\$

614-82011	Traffic Signal-Light Pole Steel (1-40 Foot Mast Arm) w/ Lum. Ext. Arm (Install Only)	EA	1	\$	\$
614-82020	Traffic Signal-Light Pole Steel (2-45 Foot Mast Arm) w/ Lum. Ext. Arm (Install Only)	EA	1	\$	\$
614-84100	Traffic Signal Pedestal Pole Aluminum – 15 Foot	EA	1	\$	\$
620-00020	Sanitary Facility	EA	1	\$	\$
625-00000	Construction Surveying	LS	1	\$	\$
626-00000	Mobilization	LS	1	\$	\$
627-00002	Thermoplastic Pavement Marking	SF	107	\$	\$
627-30405	Preformed Thermoplastic Pavement Marking (Word-Symbol)	SF	32	\$	\$
627-30410	Preformed Thermoplastic Pavement Marking (Xwalk-Stop Line)	SF	320	\$	\$
630-00000	Flagging	HOUR	300	\$	\$
630-00003	Uniformed Traffic Control	HOUR	48	\$	\$
630-00007	Traffic Control Inspection	DAY	19	\$	\$
630-00012	Traffic Control Management	DAY	45	\$	\$
630-80341	Construction Traffic Sign (Panel Size A)	EA	32	\$	\$
630-80350	Vertical Panel	EA	25	\$	\$
630-80355	Portable Message Sign Panel	EA	2	\$	\$
630-80356	Advanced Warning Sequencing Arrow Panel (A Type)	EA	2	\$	\$
630-80360	Drum Channelizing Device	EA	25	\$	\$
630-80380	Traffic Cone	EA	50	\$	\$
700-70009	F/A Minor Contract Revisions	FA	1	\$ 10,000	\$ 10,000
700-70101	F/A Relocate Irrigation Lateral	FA	1	\$ 1,000	\$ 1,000
700-70380	F/A Erosion Control	FA	1	\$ 5,000	\$ 5,000
				TOTAL	\$

APPENDIX D

FHWA 1273

FHWA-1273 -- Revised May 1, 2012

REQUIRED CONTRACT PROVISIONS FEDERAL-AID CONSTRUCTION CONTRACTS

- I. General
- II. Nondiscrimination
- III. Non-segregated 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. Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion
- XI. Certification Regarding Use of Contract Funds for Lobbying
- XII. Use of United States-Flag Vessels:

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, United States Code, as required in 23 CFR 633.102(b) (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). 23 CFR 633.102(e).

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. 23 CFR 633.102(e).

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) in accordance with 23 CFR 633.102. 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 solicitation-for-bids or request-for-proposals 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). 23 CFR 633.102(b).

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. 23 CFR 633.102(d).

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. 23 U.S.C. 114(b). The term Federal-aid highway does not include roadways functionally classified as local roads or rural minor collectors. 23 U.S.C. 101(a).

II. NONDISCRIMINATION (23 CFR 230.107(a); 23 CFR Part 230, Subpart A, Appendix A; EO 11246)

The provisions of this section related to 23 CFR Part 230, Subpart A, Appendix A 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 Part 60, 29 CFR Parts 1625-1627, 23 U.S.C. 140, Section 504 of the Rehabilitation Act of 1973, as amended (29 U.S.C. 794), Title VI of the Civil Rights Act of 1964, as amended (42 U.S.C. 2000d et seq.), 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 Part 60, and 29 CFR Parts 1625-1627. The contracting agency and the FHWA have the authority and the responsibility to ensure compliance with 23 U.S.C. 140, Section 504 of the Rehabilitation Act of 1973, as amended (29 U.S.C. 794), and Title VI of the Civil Rights Act of 1964, as amended (42 U.S.C. 2000d et seq.), 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 Part 230, Subpart A, 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 (see 28 CFR Part 35, 29 CFR Part 1630, 29 CFR Parts 1625-1627, 41 CFR Part 60 and 49 CFR Part 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 Part 35 and 29 CFR Part 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. 23 CFR 230.409 (g)(4) & (5).

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, sexual orientation, gender identity, 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 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 or other knowledgeable company official.

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, sexual orientation, gender identity, national origin, age or disability. The following procedures shall be followed:

a. The contractor will conduct periodic inspections of project sites to ensure 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. 23 CFR 230.409. 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, sexual orientation, gender identity, 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, sexual orientation, gender identity, 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 thereunder. 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, sexual orientation, gender identity, 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, 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. Assurances Required:

a. The requirements of 49 CFR Part 26 and the State DOT's FHWA-approved Disadvantaged Business Enterprise (DBE) program are incorporated by reference.

b. 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.

c. The Title VI and nondiscrimination provisions of U.S.

DOT Order 1050.2A at Appendixes A and E are incorporated by reference. 49 CFR Part 21.

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 nonminority 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 nonminority 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 total 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 more than \$10,000. 41 CFR 60-1.5.

As prescribed by 41 CFR 60-1.8, 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, sexual orientation, gender identity, 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), in accordance with 29 CFR 5.5. The requirements apply to all projects located within the right-of-way of a roadway that is functionally classified as Federal-aid highway. 23 U.S.C. 113. This excludes roadways functionally classified as local roads or rural minor collectors, which are exempt. 23 U.S.C. 101. Where applicable law requires that projects be treated as a project on a Federal-aid highway, the provisions of this subpart will apply regardless of the location of the project. Examples include: Surface Transportation Block Grant Program projects funded under 23 U.S.C. 133 [excluding recreational trails projects], the Nationally Significant Freight and Highway Projects funded under 23 U.S.C. 117, and National Highway Freight Program projects funded under 23 U.S.C. 167.

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 FHWA1273 format and FHWA program requirements.

1. Minimum wages (29 CFR 5.5)

a. Wage rates and fringe benefits. All laborers and mechanics employed or working upon the site of the work (or otherwise working in construction or development of the project under a development statute), 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 basic hourly 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. As provided in paragraphs (d) and (e) of 29 CFR 5.5, the appropriate wage determinations are effective by operation of law even if they have not been attached to the contract. Contributions made or costs reasonably anticipated for bona fide fringe benefits under the Davis-Bacon Act (40 U.S.C. 3141(2)(B)) on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of paragraph 1.e. 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 must be paid the appropriate wage rate and fringe benefits on the wage determination for the classification(s) of work actually performed, without regard to skill, except as provided in paragraph 4. of this section. 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 classifications and wage rates conformed under

paragraph 1.c. of this section) and the Davis-Bacon poster (WH-1321) must 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. Frequently recurring classifications. (1) In addition to wage and fringe benefit rates that have been determined to be prevailing under the procedures set forth in 29 CFR part 1, a wage determination may contain, pursuant to § 1.3(f), wage and fringe benefit rates for classifications of laborers and mechanics for which conformance requests are regularly submitted pursuant to paragraph 1.c. of this section, provided that:

- (i) The work performed by the classification is not performed by a classification in the wage determination for which a prevailing wage rate has been determined;
- (ii) The classification is used in the area by the construction industry; and
- (iii) The wage rate for the classification bears a reasonable relationship to the prevailing wage rates contained in the wage determination.

(2) The Administrator will establish wage rates for such classifications in accordance with paragraph 1.c.(1)(iii) of this section. Work performed in such a classification must be paid at no less than the wage and fringe benefit rate listed on the wage determination for such classification.

c. Conformance. (1) The contracting officer must 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 be classified in conformance with the wage determination. Conformance of an additional classification and wage rate and fringe benefits is appropriate 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 used 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) The conformance process may not be used to split, subdivide, or otherwise avoid application of classifications listed in the wage determination.

(3) 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 will be sent by the contracting officer by email to DBAconformance@dol.gov. 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.

(4) 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 will, by email to DBAconformance@dol.gov, refer the questions, including the views of all interested parties and the recommendation of the contracting officer, to the Administrator for determination. The 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.

(5) The contracting officer must promptly notify the contractor of the action taken by the Wage and Hour Division under paragraphs 1.c.(3) and (4) of this section. The contractor must furnish a written copy of such determination to each affected worker or it must be posted as a part of the wage determination. The wage rate (including fringe benefits where appropriate) determined pursuant to paragraph 1.c.(3) or (4) of this section must 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.

d. Fringe benefits not expressed as an hourly rate. 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 may either pay the benefit as stated in the wage determination or may pay another bona fide fringe benefit or an hourly cash equivalent thereof.

e. Unfunded plans. 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, in accordance with the criteria set forth in § 5.28, 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.

f. Interest. In the event of a failure to pay all or part of the wages required by the contract, the contractor will be required to pay interest on any underpayment of wages.

2. Withholding (29 CFR 5.5)

a. Withholding requirements. The contracting agency may, upon its own action, or must, upon written request of an authorized representative of the Department of Labor, withhold or cause to be withheld from the contractor so much of the accrued payments or advances as may be considered necessary to satisfy the liabilities of the prime contractor or any subcontractor for the full amount of

wages and monetary relief, including interest, required by the clauses set forth in this section for violations of this contract, or to satisfy any such liabilities required by any other Federal contract, or federally assisted contract subject to Davis-Bacon labor standards, that is held by the same prime contractor (as defined in § 5.2). The necessary funds may be withheld from the contractor under this contract, any other Federal contract with the same prime contractor, or any other federally assisted contract that is subject to Davis-Bacon labor standards requirements and is held by the same prime contractor, regardless of whether the other contract was awarded or assisted by the same agency, and such funds may be used to satisfy the contractor liability for which the funds were withheld. In the event of a contractor's failure to pay any laborer or mechanic, including any apprentice or helper working on the site of the work all or part of the wages required by the contract, or upon the contractor's failure to submit the required records as discussed in paragraph 3.d. of this section, the contracting agency may on its own initiative and 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.

b. Priority to withheld funds. The Department has priority to funds withheld or to be withheld in accordance with paragraph 2.a. of this section or Section V, paragraph 3.a., or both, over claims to those funds by:

- (1) A contractor's surety(ies), including without limitation performance bond sureties and payment bond sureties;
- (2) A contracting agency for its procurement costs;
- (3) A trustee(s) (either a court-appointed trustee or a U.S. trustee, or both) in bankruptcy of a contractor, or a contractor's bankruptcy estate;
- (4) A contractor's assignee(s);
- (5) A contractor's successor(s); or
- (6) A claim asserted under the Prompt Payment Act, 31 U.S.C. 3901–3907.

3. Records and certified payrolls (29 CFR 5.5)

a. Basic record requirements (1) Length of record retention. All regular payrolls and other basic records must be maintained by the contractor and any subcontractor during the course of the work and preserved for all laborers and mechanics working at the site of the work (or otherwise working in construction or development of the project under a development statute) for a period of at least 3 years after all the work on the prime contract is completed.

(2) Information required. Such records must contain the name; Social Security number; last known address, telephone number, and email address of each such worker; each worker's correct classification(s) of work actually performed; 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 40 U.S.C. 3141(2)(B) of the Davis-Bacon Act); daily and weekly number of hours actually worked in total and on each covered contract; deductions made; and actual wages paid.

(3) Statement of Compliance. Each certified payroll submitted must be accompanied by a "Statement of Compliance," signed by the contractor or subcontractor, or

the contractor's or subcontractor's agent who pays or supervises the payment of the persons working on the contract, and must certify the following:

- (i) That the certified payroll for the payroll period contains the information required to be provided under paragraph 3.b. of this section, the appropriate information and basic records are being maintained under paragraph 3.a. of this section, and such information and records are correct and complete;
- (ii) That each laborer or mechanic (including each helper and apprentice) working 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 29 CFR part 3; and
- (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(s) of work actually performed, as specified in the applicable wage determination incorporated into the contract.

(4) Use of Optional Form WH-347. The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH-347 will satisfy the requirement for submission of the "Statement of Compliance" required by paragraph 3.b.(3) of this section.

(5) Signature. The signature by the contractor, subcontractor, or the contractor's or subcontractor's agent must be an original handwritten signature or a legally valid electronic signature.

(6) Falsification. The falsification of any of the above certifications may subject the contractor or subcontractor to civil or criminal prosecution under 18 U.S.C. 1001 and 31 U.S.C. 3729.

(7) Length of certified payroll retention. The contractor or subcontractor must preserve all certified payrolls during the course of the work and for a period of 3 years after all the work on the prime contract is completed.

c. Contracts, subcontracts, and related documents. The contractor or subcontractor must maintain this contract or subcontract and related documents including, without limitation, bids, proposals, amendments, modifications, and extensions. The contractor or subcontractor must preserve these contracts, subcontracts, and related documents during the course of the work and for a period of 3 years after all the work on the prime contract is completed.

d. Required disclosures and access (1) Required record disclosures and access to workers. The contractor or subcontractor must make the records required under paragraphs 3.a. through 3.c. of this section, and any other documents that the contracting agency, the State DOT, the FHWA, or the Department of Labor deems necessary to determine compliance with the labor standards provisions of any of the applicable statutes referenced by § 5.1, available for inspection, copying, or transcription by authorized representatives of the contracting agency, the State DOT, the FHWA, or the Department of Labor, and must permit such representatives to interview workers during working hours on the job.

(2) Sanctions for non-compliance with records and worker

access requirements. If the contractor or subcontractor fails to submit the required records or to make them available, or refuses to permit worker interviews during working hours on the job, the Federal agency may, after written notice to the contractor, sponsor, applicant, owner, or other entity, as the case may be, that maintains such records or that employs such workers, 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, or to permit worker interviews during working hours on the job, may be grounds for debarment action pursuant to § 5.12. In addition, any contractor or other person that fails to submit the required records or make those records available to WHD within the time WHD requests that the records be produced will be precluded from introducing as evidence in an administrative proceeding under 29 CFR part 6 any of the required records that were not provided or made available to WHD. WHD will take into consideration a reasonable request from the contractor or person for an extension of the time for submission of records. WHD will determine the reasonableness of the request and may consider, among other things, the location of the records and the volume of production.

(3) Required information disclosures. Contractors and subcontractors must maintain the full Social Security number and last known address, telephone number, and email address of each covered worker, and must provide them upon request to the contracting agency, the State DOT, the FHWA, the contractor, or the Wage and Hour Division of the Department of Labor for purposes of an investigation or other compliance action.

4. Apprentices and equal employment opportunity (29 CFR 5.5)

a. Apprentices (1) Rate of pay. Apprentices will be permitted to work at less than the predetermined rate for the work they perform 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 (OA), or with a State Apprenticeship Agency recognized by the OA. A person who is not individually registered in the program, but who has been certified by the OA or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice, will be permitted to work at less than the predetermined rate for the work they perform in the first 90 days of probationary employment as an apprentice in such a program. In the event the OA or a State Apprenticeship Agency recognized by the OA withdraws approval of an apprenticeship program, the contractor will no longer be permitted to use apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

(2) Fringe benefits. Apprentices must 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, fringe benefits

must be paid in accordance with that determination.

(3) Apprenticeship ratio. The allowable ratio of apprentices to journey workers on the job site in any craft classification must not be greater than the ratio permitted to the contractor as to the entire work force under the registered program or the ratio applicable to the locality of the project pursuant to paragraph 4.a.(4) of this section. Any worker listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated in paragraph 4.a.(1) of this section, must 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 this section must be paid not less than the applicable wage rate on the wage determination for the work actually performed.

(4) Reciprocity of ratios and wage rates. Where a contractor is performing construction on a project in a locality other than the locality in which its program is registered, the ratios and wage rates (expressed in percentages of the journey worker's hourly rate) applicable within the locality in which the construction is being performed must be observed. If there is no applicable ratio or wage rate for the locality of the project, the ratio and wage rate specified in the contractor's registered program must be observed.

b. Equal employment opportunity. The use of apprentices and journey workers under this part must be in conformity with the equal employment opportunity requirements of Executive Order 11246, as amended, and 29 CFR part 30.

c. 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. 23 CFR 230.111(e)(2). 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 journey workers 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 as provided in 29 CFR 5.5.

6. Subcontracts. The contractor or subcontractor must insert FHWA-1273 in any subcontracts, along with the applicable wage determination(s) and such other clauses or contract modifications as the contracting agency may by appropriate instructions require, and a clause requiring the subcontractors to include these clauses and wage determination(s) in any lower tier subcontracts. The prime contractor is responsible for the compliance by any subcontractor or lower tier subcontractor with all the contract clauses in this section. In the event of any violations of these clauses, the prime contractor and any subcontractor(s) responsible will be liable for any unpaid wages and monetary relief, including interest from the date of the underpayment or loss, due to any workers of lower-tier subcontractors, and may be subject to debarment, as

appropriate. 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 as provided in 29 CFR 5.5.

9. Disputes concerning labor standards. As provided in 29 CFR 5.5, 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 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 40 U.S.C. 3144(b) or § 5.12(a).

b. No part of this contract shall be subcontracted to any person or firm ineligible for award of a Government contract by virtue of 40 U.S.C. 3144(b) or § 5.12(a).

c. The penalty for making false statements is prescribed in the U.S. Code, Title 18 Crimes and Criminal Procedure, 18 U.S.C. 1001.

11. Anti-retaliation. It is unlawful for any person to discharge, demote, intimidate, threaten, restrain, coerce, blacklist, harass, or in any other manner discriminate against, or to cause any person to discharge, demote, intimidate, threaten, restrain, coerce, blacklist, harass, or in any other manner discriminate against, any worker or job applicant for:

a. Notifying any contractor of any conduct which the worker reasonably believes constitutes a violation of the DBA, Related Acts, this part, or 29 CFR part 1 or 3;

b. Filing any complaint, initiating or causing to be initiated any proceeding, or otherwise asserting or seeking to assert on behalf of themselves or others any right or protection under the DBA, Related Acts, this part, or 29 CFR part 1 or 3;

c. Cooperating in any investigation or other compliance action, or testifying in any proceeding under the DBA, Related Acts, this part, or 29 CFR part 1 or 3; or

d. Informing any other person about their rights under the DBA, Related Acts, this part, or 29 CFR part 1 or 3.

V. CONTRACT WORK HOURS AND SAFETY STANDARDS ACT

Pursuant to 29 CFR 5.5(b), 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 watchpersons 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. 29 CFR 5.5.

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 and interest from the date of the underpayment. 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 watchpersons and guards, employed in violation of the clause set forth in paragraph 1. of this section, in the sum currently provided in 29 CFR 5.5(b)(2)* 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.

* \$31 as of January 15, 2023 (See 88 FR 88 FR 2210) as may be adjusted annually by the Department of Labor, pursuant to the Federal Civil Penalties Inflation Adjustment Act of 1990.

3. Withholding for unpaid wages and liquidated damages

a. *Withholding process.* The FHWA or the contracting agency may, upon its own action, or must, upon written request of an authorized representative of the Department of Labor, withhold or cause to be withheld from the contractor so much of the accrued payments or advances as may be considered necessary to satisfy the liabilities of the prime contractor or any subcontractor for any unpaid wages; monetary relief, including interest; and liquidated damages required by the clauses set forth in this section on this contract, 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 that is held by the same prime contractor (as defined in § 5.2). The necessary funds may be withheld from the contractor under this contract, any other Federal contract with the same prime contractor, or any other federally assisted contract that is subject to the Contract Work Hours and Safety Standards Act and is held by the same prime contractor, regardless of whether the other contract was awarded or assisted by the same agency, and such funds may be used to satisfy the contractor liability for which the funds were withheld.

b. *Priority to withheld funds.* The Department has priority to funds withheld or to be withheld in accordance with Section

IV paragraph 2.a. or paragraph 3.a. of this section, or both, over claims to those funds by:

- (1) A contractor's surety(ies), including without limitation performance bond sureties and payment bond sureties;
- (2) A contracting agency for its procurement costs;
- (3) A trustee(s) (either a court-appointed trustee or a U.S. trustee, or both) in bankruptcy of a contractor, or a contractor's bankruptcy estate;
- (4) A contractor's assignee(s);
- (5) A contractor's successor(s); or
- (6) A claim asserted under the Prompt Payment Act, 31 U.S.C. 3901–3907.

4. Subcontracts. The contractor or subcontractor must insert in any subcontracts the clauses set forth in paragraphs 1. through 5. of this section and a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor is responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in paragraphs 1. through 5. In the event of any violations of these clauses, the prime contractor and any subcontractor(s) responsible will be liable for any unpaid wages and monetary relief, including interest from the date of the underpayment or loss, due to any workers of lower tier subcontractors, and associated liquidated damages and may be subject to debarment, as appropriate.

5. Anti-retaliation. It is unlawful for any person to discharge, demote, intimidate, threaten, restrain, coerce, blacklist, harass, or in any other manner discriminate against, or to cause any person to discharge, demote, intimidate, threaten, restrain, coerce, blacklist, harass, or in any other manner discriminate against, any worker or job applicant for:

- a. Notifying any contractor of any conduct which the worker reasonably believes constitutes a violation of the Contract Work Hours and Safety Standards Act (CWHSSA) or its implementing regulations in this part;
- b. Filing any complaint, initiating or causing to be initiated any proceeding, or otherwise asserting or seeking to assert on behalf of themselves or others any right or protection under CWHSSA or this part;
- c. Cooperating in any investigation or other compliance action, or testifying in any proceeding under CWHSSA or this part; or
- d. Informing any other person about their rights under CWHSSA or this part.

VI. SUBLETTING OR ASSIGNING THE CONTRACT

This provision is applicable to all Federal-aid construction contracts on the National Highway System pursuant to 23 CFR 635.116.

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" in paragraph 1 of Section VI 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: (based on longstanding interpretation)

- (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. 23 CFR 635.102.

2. Pursuant to 23 CFR 635.116(a), 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. Pursuant to 23 CFR 635.116(c), 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. (based on longstanding interpretation of 23 CFR 635.116).

5. The 30-percent self-performance requirement of paragraph (1) is not applicable to design-build contracts; however, contracting agencies may establish their own self-performance requirements. 23 CFR 635.116(d).

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 Part 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. 23 CFR 635.108.

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 Part 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). 29 CFR 1926.10.

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 Part 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 11, 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 (42 U.S.C. 7606; 2 CFR 200.88; EO 11738)

This provision is applicable to all Federal-aid construction contracts in excess of \$150,000 and to all related subcontracts. 48 CFR 2.101; 2 CFR 200.327.

By submission of this bid/proposal or the execution of this contract or subcontract, as appropriate, the bidder, proposer, Federal-aid construction contractor, subcontractor, supplier, or vendor agrees to comply with all applicable standards, orders or regulations issued pursuant to the Clean Air Act (42 U.S.C. 7401-7671q) and the Federal Water Pollution Control Act, as amended (33 U.S.C. 1251-1387). Violations must be reported to the Federal Highway Administration and the Regional Office of the Environmental Protection Agency. 2 CFR Part 200, Appendix II.

The contractor agrees to include or cause to be included the requirements of this Section in every subcontract, and further agrees to take such action as the contracting agency may direct as a means of enforcing such requirements. 2 CFR 200.327.

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. 2 CFR 180.220 and 1200.220.

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. 2 CFR 180.320.

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. 2 CFR 180.325.

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. 2 CFR 180.345 and 180.350.

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, Subpart I, 180.900-180.1020, and 1200. "First Tier Covered Transactions" refers to any covered transaction between a recipient or subrecipient 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 recipient or subrecipient 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. 2 CFR 180.330.

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. 2 CFR 180.220 and 180.300.

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. 2 CFR 180.300; 180.320, and 180.325. A participant is responsible for ensuring that its principals are not suspended, debarred, or otherwise ineligible to participate in covered transactions. 2 CFR 180.335. 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 System for Award Management website (<https://www.sam.gov/>). 2 CFR 180.300, 180.320, and 180.325.

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 CFR 180.325.

* * * * *

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 CFR 180.335;

(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, 2 CFR 180.800;

(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, 2 CFR 180.700 and 180.800; 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. 2 CFR 180.335(d).

(5) Are not a corporation that has been convicted of a felony violation under any Federal law within the two-year period preceding this proposal (USDOT Order 4200.6 implementing appropriations act requirements); and

(6) Are not a corporation with any unpaid Federal tax

liability that has been assessed, for which all judicial and administrative remedies have been exhausted, or have lapsed, and that is not being paid in a timely manner pursuant to an agreement with the authority responsible for collecting the tax liability (USDOT Order 4200.6 implementing appropriations act requirements).

b. Where the prospective participant is unable to certify to any of the statements in this certification, such prospective participant should attach an explanation to this proposal. 2 CFR 180.335 and 180.340.

* * * * *

3. 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). 2 CFR 180.220 and 1200.220.

a. By signing and submitting this proposal, the prospective lower tier participant 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. 2 CFR 180.365.

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, Subpart I, 180.900 – 180.1020, 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 recipient or subrecipient 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 recipient or subrecipient 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. 2 CFR 1200.220 and 1200.332.

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. 2 CFR 180.220 and 1200.220.

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 System for Award Management website (<https://www.sam.gov/>), which is compiled by the General Services Administration. 2 CFR 180.300, 180.320, 180.330, and 180.335.

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. 2 CFR 180.325.

* * * * *

4. Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion--Lower Tier Participants:

a. The prospective lower tier participant certifies, by submission of this proposal, that neither it nor its principals:

(1) is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participating in covered transactions by any Federal department or agency, 2 CFR 180.355;

(2) is a corporation that has been convicted of a felony violation under any Federal law within the two-year period preceding this proposal (USDOT Order 4200.6 implementing appropriations act requirements); and

(3) is a corporation with any unpaid Federal tax liability that has been assessed, for which all judicial and administrative remedies have been exhausted, or have lapsed, and that is not being paid in a timely manner pursuant to an agreement with the authority responsible for collecting the tax liability. (USDOT Order 4200.6 implementing

appropriations act requirements)

b. Where the prospective lower tier participant is unable to certify to any of the statements in this certification, such prospective participant should attach an explanation to this proposal.

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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 Part 20, App. A.

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.

XII. USE OF UNITED STATES-FLAG VESSELS:

This provision is applicable to all Federal-aid construction contracts, design-build contracts, subcontracts, lower-tier subcontracts, purchase orders, lease agreements, or any other covered transaction. 46 CFR Part 381.

This requirement applies to material or equipment that is acquired for a specific Federal-aid highway project. 46 CFR 381.7. It is not applicable to goods or materials that come into inventories independent of an FHWA funded-contract.

When oceanic shipments (or shipments across the Great Lakes) are necessary for materials or equipment acquired for a specific Federal-aid construction project, the bidder, proposer, contractor, subcontractor, or vendor agrees:

1. To utilize privately owned United States-flag commercial vessels to ship at least 50 percent of the gross tonnage (computed separately for dry bulk carriers, dry cargo liners, and tankers) involved, whenever shipping any equipment, material, or commodities pursuant to this contract, to the extent such vessels are available at fair and reasonable rates for United States-flag commercial vessels. 46 CFR 381.7.

2. To furnish within 20 days following the date of loading for shipments originating within the United States or within 30 working days following the date of loading for shipments originating outside the United States, a legible copy of a rated, 'on-board' commercial ocean bill-of-lading in English for each shipment of cargo described in paragraph (b)(1) of this section to both the Contracting Officer (through the prime contractor in the case of subcontractor bills-of-lading) and to the Office of Cargo and Commercial Sealift (MAR-620), Maritime Administration, Washington, DC 20590. (MARAD requires copies of the ocean carrier's (master) bills of lading, certified onboard, dated, with rates and charges. These bills of lading may contain business sensitive information and therefore may be submitted directly to MARAD by the Ocean Transportation Intermediary on behalf of the contractor). 46 CFR 381.7.

ATTACHMENT A - EMPLOYMENT AND MATERIALS PREFERENCE FOR APPALACHIAN DEVELOPMENT HIGHWAY SYSTEM OR APPALACHIAN LOCAL ACCESS ROAD CONTRACTS (23 CFR 633, Subpart B, Appendix B) 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.