Colorado
Department of Transportation
Special Provisions
North Avenue Enhanced Transit Corridor Project

The 2025 Standard Specifications for Road and Bridge Construction controls construction of this project. The following special provisions supplement or modify the Standard Specifications and take precedence over the Standard Specifications and plans.

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Project Special Provisions

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Engineers Stamp

1
Notice To Bidders

Bidders shall refer to the City of Grand Junction Invitation for Bid for all bidding information related to this project.

1
Commencement and Completion of Work (Working Day)

The Contractor shall commence work under the Contract on or before the date provided in the "Notice to Proceed." The Contractor shall complete all work within 115 working days per the "Notice to Proceed."

1
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 300 hours

1
Revision of Section 101
Definitions and Terms

Subgrade.

(a) In reference to planting, **Subgrade** shall be defined as: The surface or elevation of subsoil remaining after excavation is complete, or the top surface of a fill or backfill before planting soil is placed.

Subsection 101.02 shall include the following:

ANSI. American National Standards Institute. Z60.1 is the national standard for nursery stock.

Balled and Burlapped Stock. Plants dug with firm, natural balls of earth in which they were grown wrapped with burlap, tied, rigidly supported, and drum laced with twine with the root flare visible at the surface of the ball as recommended by ANSI Z60.1.

Caliper. Caliper of a trunk as measured by a diameter tape at a height six-inches (6") above the root flare for trees up to, and including, four-inch (4") size at this height; and as measured at a height of twelve-inches (12") above the root flare for trees larger than four-inch (4") size.

Circling root(s). One or more roots whose diameter is greater than ten percent (10%) of the trunk caliper circling more than one-third of the trunk. Circling roots are unacceptable.

City. The City of Grand Junction

Co-dominant. Two or more vigorous, upright branches or stems of relatively equal diameter that originate from a common point, usually where the leader was lost or removed. Co-dominant stems are unacceptable.

Container-Grown. Healthy, vigorous, well-rooted plants grown in a container, with a well-established root system reaching sides of container and maintaining a firm ball when removed from container.

Container shall be rigid enough to hold ball shape and protect root mass during shipping and be sized according to ANSI Z60.1 for type and size of plant required.

2
Revision of Section 101
Definitions and Terms

Diameter Breast Height (DBH). Diameter of a trunk as measured by a diameter tape at a height 54-inches (54”) above the ground line for trees with caliper of 6 inches or greater as measured at a height of 12 inches above the root flare. Per ANSI Z60 American Standard for Nursery Stock.

Impacted by Construction. Trees that are directly within or adjacent to the limit of work, within or adjacent to staging/storage areas, and within or adjacent to construction access areas that are affected in a negative way.

Kinked Root. A main root that is sharply bent. Kinked roots are unacceptable.
Licensed, and Insured Arborist. A person shall be licensed and insured, per all applicable City of Grand Junction requirements for Arborists, to cut, trim, prune, or remove trees.

Office of the City Forester (OCF). The City of Grand Junction division responsible for all trees in public parks, parkways, right-of-way, and other public property.

Planting Soil. Standardized topsoil; existing, native surface topsoil; existing, in-place surface soil; imported topsoil; or manufactured topsoil that is modified with soil amendments, soil conditioners and fertilizers to produce a soil mixture best for plant growth.

Pneumatic Air Excavation Tool. A tool specifically designed to excavate soil from around tree roots. Air Spade or Air Knife are examples of pneumatic air excavation tools.

Root Flare. Also called “trunk flare”. The area at the base of the tree's stem or trunk where the stem or trunk broadens to form first order roots; the area of transition between the root system and the stem or trunk.

Soil Conditioning. Includes, but is not limited to, any soil amendment such as fertilizer, humate, mycorrhizae, and compost.

3
Revision of Section 101
Definitions and Terms

Stem-girdling Root. A circling, bent, or straight root that touches or rests on the trunk or root flare that can become a permanent root. Stem-girdling roots are unacceptable.
Subsoil. All soil beneath the topsoil layer of the soil profile and typified by the lack of organic matter and soil organisms.

Tree Protection Work Plan. The tree protection plan is a plan based on the contract drawings that includes the Contractor's approach to working within and around the Tree Protection Zones.

Tree Protection Zone (TPZ). The Tree Protection Zone is the area above and below grade around each tree where construction activities are limited or restricted to preserve tree health and structural integrity of the protected trees.

(a) The diameter of the tree shall be measured at four and one-half feet (4.5') above grade (referred to as diameter breast height). For every-one inch (1") of tree diameter the Tree Protection Zone shall extend one foot (1.0') radially from the base of the trunk or be placed at the dripline, whichever is greater.
(b) For areas with groups or groupings of trees, if the distance between trees is less than thirty feet (30'), the Tree Protection Zone may be combined and treated as one contiguous area to create a more clearly defined and manageable Tree Protection Zone.

Unsuitable Materials. Unsuitable materials refers to organic, rock and other unsuitable soil materials that cannot be compacted to 95% of Standard Proctor Density (AASHTO T-99), at optimum moisture +/- 2% for clay soils and 95% of Standard Proctor Density (AASHTO T-180), at optimum moisture +/- 2% for granular soils.

Water Excavation. Hydrovac excavation that utilizes high-pressure water to cut and liquefy the soil, while simultaneously using a vacuum to remove the soil from the excavation and will require that import fill is brought to the site to fill trenches after excavation.

4
Revision of Section 101
Definitions and Terms

Weeds. Including but not limited to Puncturvine, Field Bindweed, Dandelion, Jimsonweed, Diffuse, Spotted and Russian Knapweed, Quackgrass, Horsetail, Rush Grass, Mustard, Lambsquarter, Chickweed, Cress, Crabgrass, Canada Thistle, Nutgrass, Blackberry, Tansy Ragwort, Bermuda Grass, Johnsongrass, Poison Ivy, Nut Sedge, Nimble Weed, Bent Grass, Barnyard Grass, Perennial Sorrel, Cheatgrass, Kochia, Prickly Lettuce, Feral Rye, and Brome Grass or any weed listed on Colorado Noxious Weed List and Watch List.

Replace the following in Subsection 101.02:

Department. Refers to the City of Grand Junction

Engineer. References to the "Engineer" refer to the City of Grand Junction Project Manager.

1
Revision of Section 102
Project Plans and Other Data

Revise Section 102 of the Standard Specifications for this project as follows:

Subsection 102.05 shall include the following:

Supplemental data is provided in Land XML and DWG file formats.. The supplemental data consists of:

(a) Project Alignments - LandXML file generated of all Proposed Geometry

(b) Surfaces – LandXML files of the following:

(1) Existing Terrain Model

(2) Finished Grade Terrain Model

(c) DWG files:

(1) Right of Way

(2) Topography

(3) 2D Design Files

(d) Plans and Reports

(1) Environmental Resource Reports

(2) Subsurface Utility Engineering Plans

(3) Authorized Right of Way Plans

The City does not warrant the supplemental data and this information is not considered to be a part of the Contract. If bidders use or modify the supplemental data in preparing a proposal or planning and prosecuting the work, all associated data is used at their own risk, and bidders are responsible for all conclusions, deductions, and inferences drawn from the original or modified supplemental data.

1
Revision of Section 106
Conformity to the Contract of Hot Mix Asphalt

Revise Section 106 of the Standard Special Provisions for this project as follows:

Subsection 106.05 shall include the following:

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

1
Revision of Section 107
Right of Way Restrictions

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

Subsection 107.19 shall include the following:

The Contractor is hereby made aware that at the time of bidding on this project, The City of Grand Junction does not have possession of all necessary Right of Way required to complete portions of this project and has identified the following locations as "No Work Areas" until the Restriction Dates shown below. Please reference Right of Way Plans with an authorization date of October 27th, 2025 and revised on May 2026. The ROW plans are subject to change.

Table to be added at time of advertisement

When bidding, the Contractor is advised that the Contractor shall not enter the Parcels identified above prior to the dates indicated above, unless otherwise directed in writing by the Engineer. The Department anticipates no delay toward completion of the project due to the restrictions imposed herein. No additional time or mobilization costs shall be granted to the Contractor for delays associated with not having possession of the above-mentioned locations prior to the dates specified above.

1
Revision of Section 107
Protection and Restoration of Property and Landscape

Section 107 of the Standard Specification is hereby revised as follows:

Subsection 107.13 shall include the following:

The Contractor shall stake/paint all easements prior to any construction activities.

If the easement staking is knocked down or destroyed by the Contractor or others during construction activities, the Engineer will suspend the work, wholly or in part, until the staking is repaired or replaced as directed. Repair or replacement of the staking shall be 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.

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

No landscaping or sod shall be without watering services during the growing season. If the irrigation service is interrupted for more than three days, the Contractor shall be liable to hand/truck water and possibly all plant and sod replacement in the affected landscape and sod areas at the Contractor's expense.

(a) Requirements for trees to be protected as shown on the plans include:

(1) Establishment of a tree protection area. The tree protection area shall be installed as detailed in the landscape plans.
(2) Fence (plastic) shall be installed around the perimeter of the tree protection area.
(3) No equipment, staging, or stockpiling in the tree protection area.
(4) Tree pruning for clearance issues must have prior authorization by the Engineer.
(5) No root 2 inches or larger shall be cut; consult with the Engineer.
(6) Irrigation work within tree protection area shall be completed by hand-dig method only.
(7) Trees shall be deep-root watered at a minimum interval of once every two weeks when temperatures are at or above 40-degrees. Trees shall be watered at a rate of 20 gallons per inch caliper.

Any trees designated to be protected that are partially injured or lost due to the Contractor's operations shall be replaced in kind as directed by the Engineer at the Contractor's expense.

1
Revision of Section 108
Prosecution and Progress

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

Delete subsections 108.03 (d) and 108.03 (e) and replace with the following:

Baseline Schedule. Within 14 days of Award of the Contract, and 14 days prior to the preconstruction meeting, the Contractor shall submit a Baseline Schedule that includes all work activities completed within Contract Time. The Contractor shall not show progress in the Baseline Schedule. When approved, the Baseline Schedule shall become the Project Schedule. The Contractor shall use all information known by the Contractor at the time of bid submittal to develop the Baseline Schedule. The Baseline Schedule shall be approved before work can commence.

The Baseline Schedule shall include a traffic phasing plan for the entire duration of the project.

The Baseline Schedule shall take into account and show that utility relocation work will be occurring concurrently with this contract. The Baseline Schedule shall reflect the known utility relocation work as described in the Utility Special Provisions and/or per schedules as obtained from the various utility owners in writing. The Contractor shall insure that the Baseline Schedule does not show conflicts with the concurrent Utility Relocation work. Known utility relocations shall be coordinated as per the Project Special Provisions and the Standard Specification 105.11, Cooperation with Utilities. Any delays encountered on this project due to Known Utility Relocation work will be considered a “Nonexcusable Delay” in accordance with Standard Specification 108.08.

Subsection 108.05 shall include the following:

Work that impacts irrigation facilities shall take place between November 1st and March 31st unless otherwise specified or with written permission from the irrigation provider or lateral. See Utility Project Special Provision for additional information.

All businesses shall be provided with access during their normal business hours, unless the Contractor has prior, written approval from the business for interruptions in their accesses.

2
Revision of Section 108
Prosecution and Progress

Westbound single lane closures are allowed anytime (weekday or weekend), except within 300 feet of the North Avenue and 29 Road intersection in all directions. Lane closures for work within 300 feet of the North Avenue and 29 Road Intersection are allowed from 7 PM to 6 AM on weekdays or weekends.

The Contractor will be allowed to work daytime hours from 7am to 5pm. Work requiring night work lane closures shall occur at night between the hours of 7 pm and 6 am. Work outside of those hours will need approval from the Engineer Night work in excess of 65 db(A), measured from a distance of 25 feet or less from a residential property line, shall be limited to no more than 3 consecutive nights near the same residential noise receptor. The Contractor shall work in accordance with noise and light regulations established by the state, county, and city.

The Contractor shall produce a construction noise plan for approval by the Engineer. Items to be addressed in the construction noise plan shall include but are not limited to method of construction noise monitoring, temporary noise abatement strategies, and established violation procedures.

The Contractor shall notify Andy Gingerich with Grand Valley Transit (GVT) at 970-683-4339 or Valdon Lewis, GVT General Manager: valdon.lewis@transdev.com or Cheryl Gibboney, GVT Operations Supervisor: Cheryl.Gibboney@transdev.com, at least 7 calendar days prior to lane closures and impacts to GVT stops.

3
Revision of Section 108
Prosecution and Progress

The Contractor shall notify property owners 14 calendar days prior to construction activities within a construction or multi-purpose easement.

Delays or impacts to the Contractor due to the requirements of this provision shall not be a basis for an extension of time or additional compensation, or both.

Any denial or revocation of prior approval for traffic-handling requests shall not be the basis for any claim for additional time or compensation.

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

Subsection 108.08 shall include the following:

No work will be allowed on Saturdays or Sundays without the Engineer's prior written approval. Requests to work weekends shall be made in writing to the Engineer by noon on Thursday.

1
Revision of Section 201
Clearing and Grubbing

Section 201 of the Standard Specifications is hereby revised for this project as follows:

Construction Requirements

Subsection 201.02 shall include the following:

The Contractor shall excavate and remove an approximate (+/- 10%) volume of 170 cubic feet of soil from the existing informal detention basin at STA 160+00 LT. Landscape rock shall be reset and paid under Item 210-00004.

The existing concrete drainage channel and outlet plate shall remain in place and shall be protected from damage during construction. The basin shall be regraded to provide positive drainage to the existing concrete channel, including the area west of the proposed bus stop.

1
Revision of Section 202
Removal of Tree

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

Subsection 202.02 shall include the following:

This work includes the removal and the trimming of trees as directed by the Engineer.

The Engineer will establish environmental limits. All trees, shrubs, plants, grasses, and other vegetative materials shall remain, except as designated by the Engineer.

Prior to beginning any construction, removal, trimming, and pruning of encroaching vegetation (as determined by the Engineer) shall be completed.

Once all directed clearing, trimming, and pruning is completed and accepted, no additional clearing, trimming, cutting, or pruning will be allowed unless approved, in writing, by the Engineer.

This work shall be done by a Contractor or subcontractor who is a qualified tree surgeon and a member of the National Arborist Association. The firm's or individual's name and qualifications shall be submitted at the preconstruction conference for the Engineer's approval. A list of references and other clients shall be included with the qualifications statement. A written description of work methods and time schedules shall be submitted and approved in writing by the Engineer prior to work commencing.

Access for the removal or pruning of trees will be limited. Trees shall be felled at the risk of the Contractor. Strict limits of disturbance will be defined and shall be adhered to.

Branches on trees or shrubs shall be removed as directed by the Engineer. All trimming shall be done by skilled workmen. All work shall be done according to the following requirements:

(1) Pruning shall be done with proper, sharp, clean tools in such a manner as to preserve the natural character of the tree.

(2) All final cuts shall leave no projections on or off the branch and shall not be cut so close as to eliminate the branch collar.

2
Revision of Section 202
Removal of Tree

(3) To avoid bark stripping, all branches 2 inches in diameter and larger shall be cut using the 3-cut method. These branches shall be lowered to the ground by proper ropes.

(4) Tools used on trees known or found to be diseased, shall be disinfected with alcohol before they are used on other trees.

(5) Structural weaknesses, decayed trunk or branches, or split crotches shall be reported to the Engineer.

(6) When cutting back or topping trees, the Contractor shall use the drop-crotch method and avoid cutting back to small suckers. Smaller limbs and twigs shall be removed in such a manner so as to leave the foliage pattern evenly distributed-2-

a) When reducing size (cut back or topping) not more than one-third of the total area shall be reduced at a single operation.

b) Climbing spikes shall not be used on trees not scheduled for removal.

All debris generated by removal of tree and trimming tree shall become the property of the Contractor and hauled off site. Stumps shall be removed entirely below the ground when located under the proposed sidewalk or in conflict with other proposed appurtenances. When trees being cut off are outside the excavation limits, the stumps shall be cut so that no more than 3 inches remains above the ground surface.

Subsection 202.12 shall include the following:

Pay Item	Pay Unit
Removal of Tree	Each
Trimming Tree	Each

Chipping, stockpiling mulch, and hauling and stockpiling trunks and limbs will not be paid for separately but shall be included in the work. Removal of trees less than 4 inches in diameter will not be paid for separately but shall be included in the work.

All clearing and grubbing directed by the Engineer will be paid for as lump sum under the clearing and grubbing item.

1
Revision of Section 202
Removal of Structures and Obstructions

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

Subsection 202.02 shall include the following:

The Contractor shall mark the limits of removals in the field and shall arrange for the limits to be verified by the Engineer prior to beginning the work.

In subsection 202.02 delete the seventh paragraph and replace with the following:

The existing asphalt mat shall be removed in a manner that minimizes contamination of the removed mat with underlying material.

All removed asphalt and concrete shall become the property of the Contractor and shall be disposed of outside the project site.

The removal of irrigation junction boxes and chase drains shall include, but is not limited to, removal of cover plates, concrete curb and/or channel, and associated appurtenances.

Subsection Section 202.04 shall include the following:

Removal of Sign Foundation shall include removal of concrete sign foundations larger than or equal to 18 inches measured in width or length. If the entire foundation cannot be removed by reasonable means, the Contractor shall request approval from the Engineer to remove the top 2 feet below finished grade, or other depth, as approved by the Engineer, and abandon the remaining foundation in place. The Contractor shall fill the void left from the removal of sign foundation with a suitable material as approved by the Engineer.

Subsection Section 202.07 shall include the following:

All concrete pavement, asphalt mat, and curb and gutter designated for removal immediately adjacent to US 6 (North Avenue) pavement shall be isolated longitudinal along the roadway by the double saw cut method.

2
Revision of Section 202
Removal of Structures and Obstructions

Sawing shall be accomplished with the use of a diamond blade saw capable of cutting through reinforcing steel 2.0 inches in diameter and shall be sized to cut the full depth of the pavement or curb and gutter section. Sawing of the concrete pavement, asphalt mat or curb and gutter shall be done to a true line, with a vertical face. Sawing shall be full depth and shall go through the existing tie-bars and dowel bars, if present, leaving free vertical edges at the limits of the removal.

Sawing may be accomplished in multiple passes if necessary. The inner cut shall not extend into adjacent roadway pavement. The outer saw cut shall follow the existing joints.

Care shall be taken to prevent damage to the adjacent roadway pavement. Damage to the adjacent roadway pavement due to the removal process shall be repaired at the Contractor's expense by a method as approved by the engineer.

Sidewalk and curb and gutter shall be removed to the nearest control joint unless otherwise directed by the engineer.

Subsection 202.11 shall include the following:

The removal of the existing asphalt mat will be measured by the square yard of mat removed to the required depth and accepted regardless of thickness.

The removal of curb and gutter will be measured by the linear foot along the flow line of curb and gutter removed to the limits accepted.

The removal of curb ramps will be measured by area in square yards and paid for as removal of sidewalk.

The removal of curb that is attached to sidewalk will be measured in square yards and paid for as removal of sidewalk.

The removal of parking blocks or wheel stops will be measured by each and paid for as removal of wheel stop.

The removal of Sign Foundation will be measured by each sign foundation removed and disposed of.

3
Revision of Section 202
Removal of Structures and Obstructions

The removal of wall will be measured at the base of the wall by the linear foot of wall removed and disposed of.

The removal of irrigation junction boxes and existing chase drains shall be measured by each and paid for as removal of structure.

The removal of pipe and removal of the concrete u-shaped irrigation channel shall be measured by the linear foot and paid as removal of pipe.

Subsection 202.12 shall include the following:

Payment will be made under:

Pay Item	Pay Unit
Removal of Asphalt Mat	Square Yard
Removal of Curb	Linear Foot
Removal of Curb and Gutter	Linear Foot
Removal of Wheel Stop	Each
Removal of Concrete Pavement	Square Yard
Removal of Pipe	Linear Foot
Removal of Sidewalk	Square Yard
Removal of Sign Foundation	Each
Removal of Structure	Each
Removal of Wall	Linear Foot

Unless otherwise specified in the Contract, the disposal of the removed materials will not be measured and paid for separately but shall be included in the work.

Saw cutting required for removals will not be paid for separately but shall be included in the work.

1
Revision of Section 202
Removal of Structures and Obstructions (Special)

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

Subsection 202.01 shall include the following:

This work consists of the removal and salvaging of the following Grand Valley Transit bus stop amenity items from the project areas shown on the Plans:

The following items shall be removed and salvaged from the project:

Bus Stop Location	Shelter	Bench	Trash Receptacle
Sta. 147+00, LT		2	1
Sta. 160+00, LT		1	1
Sta. 180+00, LT		1	
Sta. 193+00, LT	1	1	

The Contractor shall provide notification seven days in advance of the salvage operation to coordinate receipt of the items. The Contractor shall provide notice to:

Andrew Gingerich
970-683-4339
andrew.gingerich@mesacounty.us

The items shall be delivered by the Contractor to the following address:
2785 US-50, Grand Junction, CO 81503

Subsection 202.12 shall include the following:

Payment will be made under:

Pay Item	Pay Unit
Removal of Structures and Obstructions (Special)	Lump Sum

The lump sum payment will be full compensation for the removal and delivery of the salvaged bus stop amenity items listed in this specification. Partial payments may be made if the work is performed in multiple months.

1
Revision of Section 202
Removal of Traffic Signal Equipment

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

Construction Requirements

Subsection 202.03 shall include the following:

All salvable material shown on the plans shall be removed, without unnecessary damage, in sections or pieces that may be readily transported, and delivered by the Contractor to the location noted above, or as directed by the Traffic Signal Supervisor. The Contractor shall be held responsible for the safekeeping of all salvable materials during the period of the Contract until they are delivered to the City location. The Contractor shall make good or replace at his own expense any such materials damaged, stolen, or otherwise lost prior to receipt by the City. All salvable materials, as designated on the plans, shall remain the property of the City.

Subsection 202.04 shall include the following:

Removal of Traffic Signal Equipment shall include existing pedestrian traffic signal faces and all incidental equipment for proposed work, except as noted on plans. All wiring shall be removed from existing conduit.

All Light Emitting Diode (LED) signal lenses in existing signal faces shall be removed prior to the removal of the signal face. These LED lenses shall be protected from damage and delivered to the location above, or as directed by the Traffic Signal Supervisor.

2
Revision of Section 202
Removal of Traffic Signal Equipment

Basis of Payment

Subsection 202.12 shall include the following:

Pay Item	Pay Unit
Removal of Traffic Signal Equipment	Lump Sum

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

Removal and transportation of LED signal lenses shall be included in the cost of Removal of Traffic Signal Equipment and will not be paid for separately.

1
Revision of Section 202
Removal of Light Standard Equipment

Section 202 of the standard specifications is hereby revised for this project to include the following:

Subsection 202.04 Signs and Traffic Signals shall include the following:

202.04 Signs, Traffic Signals and Lighting

Removal of Light Standard – Removal of Light Standard shall be completed by the Contractor and shall include the removal of the roadway luminaire. Electrical conductors shall be removed back to the nearest existing light standard to remain, or re-routed to re-connect an existing circuit for other existing light standards to remain in place. The remaining empty conduit shall be abandoned in place. Any unused direct-bury cable shall be disconnected and abandoned in place. The Contractor shall return the light standards and roadway luminaires to the Owner as directed by the Owner.

The Contractor shall fill the void left from the removal of light standard with native soil. Native soil shall be compacted to match finished grade. Top of grade shall be finished with soft scaping or landscaping to match adjacent finished grade.

Removal of Light Standard Foundation – Removal of Light Standard Foundation shall be completed by the Contractor. If the whole foundation cannot be removed by reasonable means, the Contractor shall request approval from the Owner to remove the top 24-inches, or other depth, as approved by the Owner, and abandon the remaining foundation in place.

The Contractor shall fill the void left from the removal of light standard with native soil. Native soil shall be compacted to match finish grade. Top of grade shall be finished with soft scaping or landscaping to match adjacent finished grade.

Subsection 202.12 shall include the following:

Pay Item	Pay Unit
Removal of Light Standard	Each
Removal of Light Standard Foundation	Each

2
Revision of Section 202
Removal of Light Standard Equipment

All work necessary and incidental to the removal of light standards and foundations as shown in the plans will not be measured and paid for separately but shall be included in the work.

1
Revision of Section 202
Removal of Pavement Marking

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

Construction Requirements

Subsection 202.05 shall include the following:

Pavement markings designated for removal and replacement shall be removed to a depth of 35 mils +/- 5 mils. The Contractor shall use gang stacked diamond tip blades or equivalent to create a smooth application surface to the satisfaction of the Project Engineer and have a vacuum machine on site to control dust paid for within the pay item.

The Contractor shall not perform any more removals than can be applied by the pavement marking truck during the same working day or working period.

If a rain event occurs during removal and marking application, the Contractor shall halt the removal operation and raised flexible pavement markers shall be placed at locations that have been removed but not marked while the pavement is drying prior to the marking application. Marking application shall resume when pavement is dry and has had no moisture for a minimum of 24 hours. Raised flexible pavement markers shall be installed with one marker at 40-foot centers. Grooves shall be clean, dry, and free of laitance, oil, dirt, grease, paint, or other foreign contaminants. The Contractor shall prevent traffic from traversing the grooves and shall re-clean grooves, as necessary, prior to application of the epoxy pavement markings.

2
Revision of Section 202
Removal of Pavement Marking

Basis of Payment

Subsection 202.12 shall include the following:

Payment will be made under:

Pay Item	Pay Unit
Removal of Pavement Marking	Square Foot

The work to groove the asphalt or concrete and clean the grooving residual or debris will not be measured and paid for separately but shall be included in the work.

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

1
Revision of Section 203
Potholing

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

In subsection 203.05(f), add the following:

All potholing shall be accomplished using noninvasive, vacuum equipment. All potholing methods and locations shall be preapproved by the Engineer. Any potholing that has not been preapproved by the Engineer shall be at the Contractors expense.

All data collected for potholing must be entered into PointMan per Revision of Section 625 Construction Surveying prior to potholing payment. If required, please contact CDOT at cdotpointman@gmail.com in order to obtain new login and password information. Download PointMan mobile application through the Apple Store (iOS) or Google Play (Android). Finally, please watch the following quick start guide, the video can be found at the following link: https://www.youtube.com/watch?v=X-tMvnK7vZw.

1
Revision of Section 207
Subgrade Soil Preparation

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

Description

207.01 This work consists of stockpiling, maintaining, and preparing the subsoils for the placement of the topsoil at locations shown on the plans. It also includes treatment of topsoil and importing offsite topsoil when shown on the plans.

Substitutions from this specification will not be allowed unless submitted in writing to the Engineer.

Materials

207.02 General. Topsoil shall be imported, or produced as shown on the plans. Topsoil shall be free of refuse and litter along with noxious weed seed and reproductive plant parts, as listed in current State of Colorado A and B Noxious Weed List and local agency weed lists. Topsoil shall not include heavy clay, hard clods, toxic substances, pathogens, or other material, which would be detrimental to growing native vegetation. All required amendments shall be thoroughly incorporated into parent material, onsite. All amendments shall conform to Revision of Section 212 of these Project Special Provisions. Topsoil and parent material shall be free of clods, sticks, stones, debris, concrete, and asphalt in excess of 4 inches in any dimension for all material used within the designed clear zone for the project. Topsoil outside of the clear zone may contain rock larger than 4 inches in any dimension.

Topsoil material shall consist of approved material classified into one of the material groups listed below as shown on the plans. If any of the material does not meet the criteria for one of the following classifications, it shall be processed onsite to meet the requirements for one of the material groups listed below or disposed of at the Contractor's expense.

(a) Topsoil (Imported). Imported topsoil shall be a loam or sandy loam conforming to ASTM D5268 and be fertile, friable, reasonably free from subsoil, refuse, roots, heavy or stiff clay, stones larger than 1 inch, coarse sand, noxious seeds, sticks, brush, litter, and other deleterious substances that would be detrimental to its use on the project; suitable for the germination of seeds and the support of vegetative growth.

2
Revision of Section 207
Subgrade Soil Preparation

- Topsoil shall meet the following conditions.
  - It shall be obtained from the top 6 inches of well drained areas.
  - The pH value shall be between 6.5 minimum and 8.5 maximum. A pH of 7.5 is preferred.
  - The soil texture shall be:
    - Sand: 30% to 50%
    - Silt: 30% to 50%
    - Clay: 5% to 30%
  - Additives: As determined by soil fertility tests.
  - Percent Organic Content:
    - Shall be 3 to 5 percent maximum after amending or conditioning.
  - Soluble Salts: Electric conductivity (EC) shall be less than 2.0 mmhos/cm for turfgrass areas, dryland areas, and planting beds.

(b) Squeegee Topsoil Admixture

- Semi-round, one quarter inch minus (1/4”-) stone. Clean, dry, and free of organic and deleterious material.

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

(1) Steel rod with a minimum diameter of 1/2 inch with graduations (tick marks) every 6 inches.
(2) The rod shall be made of stainless steel or other metal that will not bend when weight is applied.
(3) The end of the rod shall have a 30-degree cone tip.
(4) The diameter of the cone at its tip shall be no more than 0.1 inch.
(5) The top of the rod shall be a T-handled configuration.

3
Revision of Section 207
Subgrade Soil Preparation

Construction Requirements

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

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

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

Underground utilities shall be located prior to soil preparation.

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

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

4
Revision of Section 207
Subgrade Soil Preparation

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

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

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

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

207.06 Placement of Topsoil Prior to placement of topsoil material, the Contractor shall meet the following requirements.

5
Revision of Section 207
Subgrade Soil Preparation

(a) General.

- Contractor shall follow City of Grand Junction guidelines for all product data and required soil analysis reports listed under each material group below. This includes, but is not limited to the following:
    - Recommendations for application and use.
    - Test data substantiating that products comply with requirements.
    - Material certificates for soil conditioner, soil amendments, and fertilizer before delivery to the site, according to the following:
        - Manufacturer's qualified testing agency's certified analysis of standard products.
        - State, Federal, and other inspection certificates shall accompany invoice for materials showing source or origin.
        - State, Federal, and other inspection certificates shall accompany invoice for materials showing source or origin.
- Do not deliver or place topsoil in a frozen, wet, or muddy condition.
- Protect stored and placed topsoil from vehicular traffic, equipment storage, material storage, or from contaminants or pollution sources. Topsoil that is compacted or tainted during construction is to be removed from site and disposed of at a licensed landfill at no additional cost to the project.
- Examine areas where the work of this Section will be performed for compliance with requirements and conditions affecting installation and performance.
    - Verify that no foreign or deleterious material or liquid such as paint, paint washout, concrete slurry, concrete layers or chunks, cement, plaster, oils, gasoline, diesel fuel, paint thinner, turpentine, tar, roofing compound, or acid has been deposited in soil within the work area.
    - Verify that final grades are completed in accordance with the Plans.

6
Revision of Section 207
Subgrade Soil Preparation

- Timing: Perform soil preparation just prior to planting operations and in accordance with final planting schedule.
    - Coordinate with irrigation system installation to avoid damage.
- Proceed with installation only after unsatisfactory conditions have been corrected and approved by the Engineer.
- **Imported Topsoil.**
    - Contractor shall submit source location for topsoil to be imported to site for approval by the Engineer.
    - At least 10 days prior to topsoil delivery, Contractor shall notify the Engineer of the source(s) from which topsoil is to be furnished.
    - Any topsoil or fill material to be moved to and placed on City-owned property must be free of contamination (observed or previously documented) and be acceptable for unrestricted residential use. Imported topsoil or material that contains stains, odors, or debris regardless of analytical results shall not be imported to City-owned property.
    - The Contractor shall submit appropriate environmental information to the Engineer as follows:
        - Imported Material from a Quarry: A letter shall be submitted to the Engineer specifying the type of material.
        - Imported Material from a Source Other than a Quarry: Submit a Phase I Environmental Assessment (ESA) and sampling protocol and/or a Phase II ESA or similar.

7
Revision of Section 207
Subgrade Soil Preparation

- One quart sample per 500 cubic yards of imported soil is required, with individual tests completed for each sample. Soil shall be in sealed containers with content, source, and date obtained. Each Sample shall be typical of the material to be furnished and provide an accurate representation of composition, color, and texture and be accompanied by the results of the analysis. Follow instructions from soil testing laboratory when collecting samples.

- A soil analysis report for topsoil imported to site shall be provided, from the State University Agricultural Extension Service or other approved soil testing laboratory. The report shall cover soil textural classification (percentages of sand, silt, and clay), pH, percentage organic matter, and soluble salts (electric conductivity in millimos/centimeter) and shall include additive recommendations.

(b) Soil Preparation in Planting Bed Areas

- Soil Amendments, as determined by soil fertility tests

  - Apply Soil Amendments per manufacturer's recommendations, and at the quantities indicated in the soils test results.

  - After applying Soil Amendments, thoroughly till area to depth of six inches (6") minimum by plowing, rototilling, harrowing, or disking until soil is well pulverized and thoroughly mixed. Soil Conditioners and Fertilizer shall be applied topically once final grade has been established and just prior to sodding or seeding.

(c) Installation of Topsoil

- Scarify compacted subgrade to an 8 inches depth to bond topsoil to subsoil. Place topsoil to a minimum depth of 6 inches after settlement. Topsoil shall be free from weeds, sod, and material larger than 1 inch, toxic substances, litter, or other deleterious material. Spread evenly and grade to elevations and slopes shown on the Plans. Hand rake inaccessible areas to machine grading.

8
Revision of Section 207
Subgrade Soil Preparation

- Topsoil should only be handled when it is dry enough to work without damaging soil structure. Contractor shall place topsoil in a method that does not re-compact subgrade material using low ground-contact pressure equipment, or by excavators and/or backhoes operating adjacent to it.

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

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

- Thoroughly mix soil with squeegee for a minimum of four-inch (4”) depth for a ratio of one to one (1:1). This is not in lieu of specified mulch.

(d) Cleaning

- Keep adjacent paving and other areas free of topsoil. Maintain a clean and orderly work area.

- Remove debris and excess materials from the site. Clean out drainage inlet structures. Clean all paved and finished surfaces that are soiled because of the work under this Section.

(e) Protection and Repair

- Provide and install barriers as required and as directed by the Engineer to protect completed areas against damage from pedestrian and vehicular traffic until Acceptance by the City.

9
Revision of Section 207
Subgrade Soil Preparation

- Protect areas of topsoil from additional compaction, disturbance, and contamination. Prohibit the following practices within these areas except as required to perform planting operations:
    - Storage of construction materials, debris, or excavated material.
    - Parking vehicles or equipment.
    - Vehicle traffic.
    - Foot traffic.
    - Erection of sheds or structures.
    - Impoundment of water.
    - Excavation or other digging unless otherwise indicated.
- If prepared soil or subgrade is disturbed or contaminated prior to planting, the Contractor shall restore or replace the topsoil as directed by the Engineer at no additional cost to the project.

Method of Measurement

207.07 Topsoil (Imported) shall be measured in cubic yards and include the actual number of units of specified material(s) placed and accepted at the locations shown on the plans, or as directed by the Engineer.

Subgrade soil preparation will be measured by the square feet of subgrade which is ripped and accepted for adequate de-compaction. Soil Amendments determined by soil fertility testing and applied per manufacturer's recommendations at the quantities indicated in the soils test results shall be included in the unit cost.

Squeegee Topsoil Admixture shall be measured in cubic yards and include the actual number of units of specified material(s) placed and accepted at the locations shown on the plans, or as directed by the Engineer.

10
Revision of Section 207
Subgrade Soil Preparation

Basis of Payment

207.08 The accepted quantities measured will be paid for at the Contract unit price for each of the pay items listed below that appear in the bid schedule.

Payment will be made under:

Pay Item	Pay Unit
Subsoil Preparation	Square Yard

Costs associated with sampling and testing imported topsoil and subgrade soil per subsection 207.06 will not be paid for separately but shall be included in the work.

Noxious Weed Management will be measured and paid for in accordance with Revision of Section 217 of these Project Special Provisions.

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

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

Removing of clods, sticks, stones, debris, concrete, and asphalt in excess of 4 inches in any dimension for all topsoil will not be measured and paid for separately but shall be included in the work.

1
Revision of Section 208
Water Control and Dewatering

Section 208.01 of the Standard Specifications shall include:

This work consists of labor, methods, materials, and equipment associated with controlling and dewatering groundwater, channel flows, irrigation flows, and storm flows during construction.

The Contractor shall be responsible for the project and shall take such precautions as may be necessary to construct the project in a dry condition and provide for drainage, dewatering, and control of all surface and subsurface water and shall erect any necessary temporary structures or other facilities at their expense. Work area within drainage channels/ditches is subject to intermittent and potentially extensive runoff conditions that may cause localized flooding and/or soil erosion without proper protection.

Section 208.03 of the Standard Specifications shall include:

A. **General:**

Any dewatering of groundwater for construction purposes will require a Colorado Dewatering permit, which shall be obtained by the Contractor in accordance with Revision of Section 107. If the site disturbance is equal to or greater than one (1) acre, a Colorado Stormwater Permit is required, and shall be obtained by the City and transferred to the Contractor prior to the start of construction. Costs for preparing all permit applications and any fees are considered part of the work.

The Contractor shall develop and submit a Water Control and Dewatering Plan for approval by Engineer a minimum of 30 days prior to beginning ground disturbing activities. The plan shall show the phasing of the construction, including all methods and devices (indicated in each phase) used to control water and dewatering of excavations. In addition, all temporary control devices shall be shown on these plans.

For all work, the Contractor shall provide suitable equipment and labor to remove water and shall keep the excavations dewatered so that construction can be carried on under dewatered conditions. Water control shall be accomplished such that no damage is done to adjacent banks or structures. The Contractor is responsible for familiarizing themselves with all site conditions that may affect the work including, but not limited to, surface water, level of groundwater, and the time of year the work is to be done. All excavations made as part of dewatering operations shall be backfilled with the same type material as was removed and compacted in accordance with Section 203 and Revisions, except where replacement by other materials is specified.

2
Revision of Section 208
Water Control and Dewatering

At all times outside of performing construction activities, Contractor shall not leave construction equipment and materials within or near the flow paths of surface water. Damage to the Contractor's equipment and materials will be at the Contractor's expense.

B. **Surface Water Control:**
Surface water control generally falls into the following categories:

1. Normal range of flows along gutters is expected during the construction period,
2. Constant and intermittent flows along the ditches at each work site, and
3. Local surface runoff and inflows not conveyed by pipelines or culverts.

The Contractor shall coordinate, evaluate, design, construct, and maintain temporary water control conveyance systems. These systems shall not worsen flooding, alter major flow paths, degrade flow characteristics during construction or cause erosion or flooding adjacent structures. The Contractor is responsible to ensure that the flood risk is not increased as a result of their operations.

The Contractor shall be responsible for diverting the quantity of surface flow around or through the construction area so that the excavation for pipes, riprap, and other project elements remain free of surface water for the time it takes to install these items, and the time required for curing of any grout and concrete. The Contractor is cautioned that the minimum quantity of water to be diverted is for erosion control and construction purposes and not for general protection of the construction site. It shall be the Contractor's responsibility to determine the quantity of water which shall be diverted to protect his work from damage caused by stormwater. All damages and rework related to inadequate or failed water control measures shall be paid by the Contractor.

The Contractor shall, at all times, maintain a flow channel or route surface flows at the construction sites. Temporary structures such as pipes, berms, sandbags, pumps, etc. shall be permitted as long as such measures are not a major obstruction to flood flows, do not worsen flooding, or alter historic flow routes.

3
Revision of Section 208
Water Control and Dewatering

C. Groundwater Control:

The Contractor shall install adequate measures to maintain the level of groundwater a minimum of 2 feet below the foundation subgrade elevation and maintain sufficient bearing capacity for structures, pipelines, earthwork, and earthwork. Such measures may include, but are not limited to, installation of perimeter subdrains, pumping from drilled holes, or by pumping from sumps excavated below the subgrade elevation. Any foundation bearing surfaces are to be kept dewatered and stable until the structures or other types of work are complete and backfilled. Disturbance of foundation subgrade by Contractor operations shall not be considered as originally unsuitable foundation subgrade and shall be repaired at Contractor's expense.

Basis of Payment

Section 208.04 of the Standard Specifications shall include:

Water Control and Dewatering: No separate measurement or payment will be made for temporary water control and dewatering devices. All water control and dewatering devices required as part of the Contractor's Water Control and Dewatering Plan shall not be paid for separately but shall be included in the work.

No payment will be made for temporary erosion control devices for which there is not a pay item in the bid schedule. All additional temporary erosion control devices required as part of the Contractor's Water Control and Dewatering plan shall not be paid for separately but shall be included in the work.

1
Revision of Section 210
Reset Meter and Fire Hydrant

Revise Section 210 of the Standard Specification for this project as follows:

Subsection 210.01 shall include the following:

This work includes the removal and resetting of City of Grand Junction (City) water meters and fire hydrant facilities in a manner complying with Grand Junction Standard Specifications for the Construction of Underground Utilities – Water Lines, Sanitary Sewers, Storm Drains, Underdrains and Irrigation Systems (City Waterline Specifications), included as an Appendix to these Specifications.

Section 210.02 shall include the following:

Relaid pipe and conduit and reset structures shall be cleaned of foreign material before reinstallation.

Except in areas to be excavated, all holes resulting from the removal of structures shall be neatly backfilled. Methods shall conform to those required in the specifications for the various types of construction involved.

Materials in good condition from removed structures may be re-used. Salvable material is not re-used shall remain the property of the City, and the Contractor shall be held responsible for safekeeping of all materials until receipted by the City. Materials damaged, stolen, or lost before receipt by the City shall be repaired or replaced, as determined by the Engineer, at no cost to the City.

Unserviceable material, as determined by the Engineer, shall be replaced with new material of similar dimensions, and the material costs will be paid for per subsection 109.04(b), except as otherwise provided in this section. All new materials and replacement parts shall conform to the requirements of the Contract and City Waterline Specifications for the appropriate items.

2
Revision of Section 210
Reset Meter and Fire Hydrant

Section 210.10 shall include the following:

Reset Meter – Reset meter shall apply to existing water meters as shown in the Plans. Construction operations shall consist of the careful removal and storage of the existing meter, reconnection of the existing water service line, and re-installation of the meter and associated appurtenances in the locations shown on the Plans and approved by the Engineer. Work on the water services shall be completed according to City Waterline Specifications and shall be subject to inspection and testing by the City of Grand Junction. Contractor shall coordinate outages with the meter user and City of Grand Junction in accordance with the City Waterline Specifications. Reset Fire Hydrant – Construction operations shall consist of the careful removal and storage of the existing fire hydrant, reconnection of the existing water service line, and re-installation of the hydrant, valve, and associated appurtenances and infrastructure in the locations shown on the Plans and approved by the Engineer. Reset of the hydrant on shall be completed according to City Waterline Specifications and shall be subject to inspection and testing by the City of Grand Junction. Contractor shall coordinate outages with the City of Grand Junction in accordance with the City Waterline Specifications.

Section 210.12 shall include the following:

The quantity to be measured for “Reset Meter” and “Reset Fire Hydrant” shall be the actual number of those items restored for service at the new location, completed, and accepted. Reset of these items shall include all work necessary to remove the items from their existing location to the new location, and shall include all coordination, materials, placement, storage, backfill and all other work necessary to complete the reset items to the City’s satisfaction. 210.12

Subsection 210.13 shall include the following:

Payment will be made under:

Pay Item	Pay Unit
Reset Meter	Each
Reset Fire Hydrant	Each

1
Revision of Section 210
Reset Landscape Rock

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

Description

Subsection 210.01 shall include the following:

This work consists of removing, salvaging, stockpiling, and resetting existing landscape rock at the locations shown on the plans.

Construction Requirements

Subsection 210.02 shall include the following:

Prior to removal, the existing landscape rock shall be documented including type, size, color, depth, and limits. The documentation shall be submitted to the Engineer.

The Contractor shall remove and stockpile landscape rock separately from soil and other materials. Soil, vegetation, debris, and other foreign material shall be removed from salvaged rock prior to resetting.

The underlying surface shall be prepared to the grades shown on the plans. Where grades are not specified, existing grades and drainage patterns shall be restored. Existing landscape fabric disturbed by the work shall be replaced with permeable weed-control fabric approved by the Engineer. Fabric shall be installed according to the manufacturer’s recommendations.

Landscape rock shall be reset to the existing documented limits outside of the newly constructed concrete sidewalk, curb and gutter, or other items. The rock shall be placed back to match the documented depth. The rock shall be distributed uniformly and blended into the adjacent undisturbed landscaping. Rock shall be kept clear of sidewalks, curb ramps, drainage openings, and irrigation equipment.

Any landscape rock lost, damaged, or contaminated by the Contractor shall be replaced with rock matching the existing type, size, and color at no additional cost to the City. Replacement rock shall be approved by the Engineer prior to placement.

2
Revision of Section 210
Reset Landscape Rock

Any excess rock remaining after resetting is complete and accepted by the Engineer, shall be disposed of by the Contractor at no additional cost to the City.

Method of Measurement

Subsection 210.12 shall include the following:

Reset Landscape Rock will be measured by the square foot of surface area completed and accepted.

Basis of Payment

Subsection 210.13 shall include the following:

The accepted quantity of Reset Landscape Rock will be paid for at the contract unit price per square foot

Payment will be made under:

Pay Item	Pay Unit
Reset Landscape Rock	Square Foot

Payment includes removal, salvaging, cleaning, stockpiling, hauling, surface preparation, replacement of disturbed landscape fabric, resetting, and replacement of rock lost, damaged, or contaminated by the Contractor.

1
Revision of Section 213
Landscape Rock

Description

213.01

(a) This work consists of furnishing and placing rock mulch in the planting beds, per the Contract or as directed. Mulching may be accomplished by approved methods with approved materials. When a specific mulching method is required, it will be designated in the Contract.

(b) This work consists of furnishing and placing boulders in accordance with these specifications and in conformity with the details shown on the plans, or as directed.

Materials

213.02 Materials shall conform to the following requirements.

(a) **Rock Mulch.** Angular ½" granite chip. Materials for mulching shall consist of clean, dry, and free or organic and deleterious materials, and locally sourced.

- Color: TBD.
- Product Samples: one (1) gallon bag minimum.

(b) **Landscape Boulders.** Landscape boulders shall consist of hard, dense, sound rock, subject to approval. Thin slab type stones and flaking rock will not be accepted. Locate suitable boulders and obtain the Engineer's approval of the selected boulders prior to transport. Deliver boulders to a stockpile area designated by the Engineer.

- Color: TBD.
- Size:
  - Small: L = 1.5'-2.5', W = 1'-2', H = 1'-2'
  - Medium: L = 2.5'-3.5', W = 2'-3', H = 2'-3'
  - Large: L = 3.5'-4.5', W = 3'-4', H = 3'-4'

2
Revision of Section 213
Landscape Rock

Construction Requirements

213.03

(a) **Mulching.**

- **Trees in Beds.** Create a forty-eight-inch (48”) radius from the outside of the trunk, by three inch (3”) high formed soil berm around tree and fill with three-inch (3”) deep specified rock mulch. Mulch shall be kept four to six-inches (4”-6”) away from tree trunk.

- **Shrubs, Perennials, and Grasses.** Mulch backfilled surfaces of pits, planting bed areas, and other areas indicated or as directed by Engineer. Apply three inches (3”) thick layer of mulch and finish level with adjacent finished grades. Do not place mulch against the stems of plants

- **General**. Areas not properly mulched, or areas damaged due to the Contractor's negligence, shall be repaired and remulched as described above, at the Contractor's expense.

  Mulch removed by circumstances beyond the Contractor's control shall be repaired and remulched as ordered. Payment for this ordered corrective work shall be at the contract prices.

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

Method of Measurement

213.04

(a) **Mulching**. The quantity of rock mulch will be made by the contract unit specified for Mulch (Square Foot). Measurement shall include the actual number of units of specified material placed and accepted at the locations shown on the Contract Drawings, or as directed by the Project Manager, and in accordance with the Specifications.

3
Revision of Section 213
Landscape Rock

Basis of Payment

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

Pay Item	Pay Unit
Rock Mulch (Weed Free)	Square Feet

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

1
Revision of Section 214
Planting

Section 214 of the Standard Specifications for this project shall be deleted and replaced with the following:

Description

214.01 This work consists of furnishing, installing, watering, and maintaining existing and proposed live woody plant material including, but not limited to trees, shrubs, perennials, live willow and cottonwood stakes, landscape establishment, weed control, re-seeding, mowing, and irrigation system repair.

Materials

214.02

Part 1. General. Furnish and install nursery-grown trees and shrubs conforming to the requirements of ANSI-Z-60 and ANSI A300, Part 6, with healthy root systems developed by transplanting or root pruning. Provide well shaped, symmetrical, fully branched, healthy, and vigorous stock free of disease, insects, eggs, larvae, girdling, and defects such as sun scald, injuries, abrasions, and disfigurement.

Label all plants of each size, caliper genus, species cultivar or variety with a securely attached waterproof tag bearing legible designation of botanical and common name.

All plants shall be the genus, species, variety or cultivar designated on the Contract Drawings. No substitutions will be accepted without the prior written approval of the Landscape Architect and City Forestry representative. Contractor must provide proof of non-availability.

(a) **Trees**. These specifications shall apply to deciduous, broadleaf evergreen and coniferous species. Note that leaf characteristics will not be evident on deciduous trees during the dormant season.

2
Revision of Section 214
Planting

- **Crown**. The form and density of the crown shall be typical for a young specimen of the species/cultivar. Changes in form caused by wind, pruning practices, pests, or other factors shall not substantially alter the form for the species/cultivar. These crown specifications do not apply to plants that have been specifically trained in the nursery to be topiary, espalier, multi-stem, or clump; or unique selections such as contorted or weeping cultivars.

    - Trees shall have a single, relatively straight trunk, and central leader, unless noted on plans to be “Multi-trunk” or “Clump”. They shall be free of co-dominant stems and vigorous, upright branches that compete with the central leader. If the original leader has been headed, a new leader at least one-half of the diameter of the original leader shall be present.

    - Main branches shall be evenly distributed along the central leader, not clustered together. They shall form a balanced crown appropriate for the age of the species/cultivar.

    - Branch diameter shall be no larger than one-half the diameter of the central leader measured 1 inch above where the branch is attached.

    - The attachment of the largest scaffold branches shall be free of included bark.

    - Temporary branches, unless otherwise specified, should be present along the lower trunk below the lowest scaffold branch. These branches should be no greater than 3/8-inch diameter. Clear trunk shall be no more than 30 percent of the total height of the tree, unless otherwise noted.

- Trunk. The tree trunk shall be relatively straight, vertical, and free of wounds, except properly made pruning cuts, which shall be closed over or less than 3/4-inch diameter open, sunburned areas, conks (fungal fruiting bodies), wood cracks, bleeding areas, signs of boring insects, galls, cankers, stem-girdling ties, or lesions (mechanical injury).

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Revision of Section 214
Planting

- Trunk caliper and taper shall be sufficient so that the tree will remain vertical without a stake. Trunk caliper at 6 inches above the soil media (substrate) surface shall be a minimum of 2 inches and a maximum of 3 inches. Any caliper sizes outside of that range will only be allowed with approval from the Engineer.

- The cut made when re-growing the top should be just above the major structural roots. The "shank" that results from this procedure should be at a consistent height above the structural roots and no longer than 5 inches, to ensure that the trees are consistently planted at the correct depth. The base of the trunk should not have a large pruning cut from re-growing the top.

(b) **Roots**. The root system shall be substantially free of injury from biotic (e. g., insects and pathogens) and abiotic (e. g., pesticide toxicity and salt injury) agents.

- The uppermost roots or root collar shall be within the upper 2 inches of the soil media (substrate). Depth of the root-ball shall be measured from the top of the ball, which in all cases shall begin at the root flare. Soil above the root flare shall not be included in the root-ball depth measurement and shall be removed.

- The tree shall be well rooted in the soil media (substrate). Root distribution shall be uniform throughout the soil or media and radial from the trunk. Structure and growth shall be appropriate for the genus, species and cultivar or variety. When the burlap or container is removed, the root-ball shall remain intact. Trees should have several lateral roots or many fibrous roots spaced evenly around the trunk to provide support so the trees are stable when planted. Trees should have as many small roots as possible. Fibrous roots can be achieved by root-pruning, using air-pruning containers, or under-cutting or root pruning and transplanting at any stage of production.

- The root collar and the inside portion of the root-ball shall be free of defects, including circling, kinked, and stem-girdling roots. Soil removal or root washing near the root collar may be necessary to inspect for the aforementioned root defects.

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Revision of Section 214
Planting

- Roots on the periphery and bottom of the root-ball shall be less than 1/8-inch diameter.

- As a general rule, for young nursery-grown trees, there should be two or more structural roots within 1- to 3-inches of the soil surface. “First order lateral roots” is another term that has been used for these roots. If the roots are deeper than 3 inches, the stock shall be rejected.

- Root-balls that are undersized as specified in current edition of ANSI Z60.1. shall be rejected. Field grown trees for balled and burlap delivery shall have the roots pruned at least 6 inches inside the final root-ball size performed within adequate time for the tree to develop fibrous roots at the outer edge of the root-ball prior to harvest and delivery.

- Ball and burlap trees are acceptable per the specifications. If ball and burlap trees are not able to be procured, container trees may be substituted with the approval from the Engineer.

(c) **Leaves**. The size, color, and appearance of leaves shall be typical for the time of year and stage of growth of the species or cultivar. Trees shall not show signs of prolonged stress or extended drought as indicated by under or oversized leaves, wilted, shriveled or dead leaves.

(d) **Branches**. Shoot growth (length and diameter) throughout the crown shall be appropriate for the age and size of the species/cultivar. Trees shall not have dead, diseased, broken, crossing, distorted, or otherwise injured branches.

- All deciduous trees of one species used in formal rows or groupings shall exhibit cultural uniformity, i.e., “matched” in height, crown width and shape, height to first branch, and trunk taper. For this reason, it is desired that these trees be produced by a single grower.

(e) **Collected Stock.** Do not use plants harvested from the wild, from native stands, from an established landscape planting, or not grown in a nursery.

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Planting

(f) **Shrubs.**

- Container Grown Shrubs: All specifications for container grown plants shall include both plant size and container size. Plant size intervals and reference to height or spread shall be in accordance with the guidelines for the appropriate plant type set forth in ANSI Z60.1.

  - Container size shall be by container classification (i.e., not by container volume) as set forth in the ANSI Z60.1 Container Class Table.

  - In all cases, container grown nursery stock shall meet the following general requirement:

    - All container grown nursery stock shall be healthy, vigorous, well rooted, and established in the container in which it is growing. Container grown nursery stock shall have a well-established root system reaching the sides of the container to maintain a firm ball when the container is removed but shall not have girdled or kinked roots and/or root growth encircling the inside of the container.

    - The container shall be sufficiently rigid to hold the ball shape and to protect the root mass during shipping.

    - Minimum shrub sizes shall conform to the following standards:

  Tender shrubs (Type 0) that do not produce top growth that is winter hardy:

Height or Spread	Minimum number of canes	Minimum spread of roots
Fifteen inches (15”)	Three (3) canes	Nine inches (9”)

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Revision of Section 214
Planting

Small shrubs (Type 1) that grow to a mature height of not more than 3 feet:

Height or Spread	Minimum number of canes	Minimum spread of roots
Fifteen inches (15”)	Four (4) canes	Nine inches (9”)

Intermediate shrubs (Type 2) that grow to a mature height between 3 feet and 7 feet:

Height or Spread	Minimum number of canes	Minimum spread of roots
Two feet (2’)	Four (4) canes	Twelve inches (12”)

Large shrubs (Type 3) that grow to a mature height exceeding 7 feet:

Height or Spread	Minimum number of canes	Minimum spread of roots
Four feet (4’)	Six canes (6)	Twenty inches (20”)

(g) **Perennials, Grasses, Groundcovers, and Vines.** All container grown plants shall be healthy, vigorous, well rooted, and established in the container in which they are growing and be in conformance with ANSI Z60.1. A container grown plant shall have a well-established root system reaching the sides of the container to maintain a firm ball when the container is removed but shall not have girdled or kinked roots and/or root growth encircling the inside of the container. Top growth is to be in conformance with established nursery standards.

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Planting

(h) **Tree-Stabilization Materials.**

- Deciduous and Evergreen Tree Stakes: Rough-sawn, sound, new softwood with specified wood preservative treatment by pressure process, free of knots, holes, cross grain, and other defects, 2-inch diameter by 6 feet, pointed at one end.
- Guys and Tie Wires: ASTM A 641/A 641M, Class 1, #14 galvanized-steel wire, two-strand, twisted. Guying must be approved by the Engineer.
- Tree-Tie Webbing: UV-resistant nylon webbing with brass grommets, size as indicated.
- Safety Signals for Guy and Staking Wire: 1/2 inch diameter PVC pipe, length as indicated.
- Tree-Wrap:
    - Two layers of crinkled paper cemented together with bituminous material, 4 inches wide minimum, with stretch factor of 33 percent.
    - Tree wrap tape: Tape as approved by the Engineer.

(i) **Planting Backfill Material.** Unless otherwise directed by the Landscape Architect, the plant pit backfill material shall consist of the following, thoroughly mixed:

- Soil originally excavated from the pit: 2/3 proportion of total mix.
- Soil Amendments and Admixtures as specified in Revision of Section 207 – Topsoil (Imported) and Subgrade Soil Preparation.

(j) **Mulch**. As specified in Revision of Section 213 – Mulch.

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Revision of Section 214
Planting

(k) **Water**. Water supply shall be coordinated with Engineer.

Irrigation System: If water supply is available through existing nearby infrastructure. When existing irrigation system is not available, either during seasonal shutdowns or project shutdowns, the Contractor is responsible to bring water to the site. If access to the existing irrigation system is needed during seasonal shutdowns and if approved by the Engineer, the Contractor shall take responsibility for start-up and winterization of the irrigation system to avoid damage to the system. The Contractor shall take the irrigation system on at their own risk and at no additional cost to the project if damage occurs.

Hydrant: If water supply is from a hydrant, the Contractor shall supply a City of Grand Junction Water Services approved and calibrated water meter to measure water usage and be responsible to pay all costs related to water usage. The cost of water shall be charged at the current City of Grand Junction Water Services rates.

Water Truck: If no other water supply is available, the Contractor shall be responsible to bring water to the site to water per the Contract Documents and site conditions via water truck.

(l) **Miscellaneous Materials.**

- Antidesiccant: Water-insoluble emulsion, permeable moisture retarder, film forming, for trees, as approved by the Engineer. Deliver in original, sealed, and fully labeled containers. Mix and apply according to manufacturer’s instructions.

- Pre-Emergent Pesticide: As approved by the Landscape Architect.

(m) **Pesticides**. EPA registered and approved, and as approved by the Landscape Architect.

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Planting

Construction Requirements

214.03 Submittals for Planting

Part 1 Submittal Descriptions:

- Product Data. For each type of product.
- Plant Materials: Include quantities, sizes, quality, and sources for plant materials.
- Product Samples. At a minimum provide the following samples for approval by the Engineer, additional product samples may be required at the direction of the Engineer.
    - Mulch: one gallon bag minimum of each type of mulch, if applicable.
    - Tree Stakes: one of each type.
    - Tree Straps: one each.
    - Guy Material: 1 linear foot.
    - Guy Signal: 1 linear foot.
    - Tree Wrap: 1 linear foot.
- Pesticides. Product label, Safety Data Sheet (SDS) labels and manufacturer's application instructions specific to project.
- Proper Identification. All plants shall be true to name as ordered or shown on planting plans and shall be labeled individually or in groups by species and cultivar (as appropriate).
- Contractor shall provide a complete list of all plant material for approval by the Engineer a minimum of 10 days prior to delivery. Any substitutions of plant material, including but not limited to size, type, species and variety shall be listed and submitted to the Engineer for approval.

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Planting

- Tree Planting Permit. The contractor shall obtain a planting permit request form the City of Grand Junction's City Forester and submit the completed form to the Landscape Architect.

- Certificates and Analysis. Contractor shall provide the following certificates:

    - State Inspection Certificate from the origin nursery.

    - Certificate from origin state.

    - Quarantine Certificate from origin state.

    - Any Certificates required by the USDA Animal and Plant Health Inspection Service (APHIS) and ANSI-Z-60 and accompanying Rules and Regulations.

    - Analysis of existing soil shall be per Revisions of Section 207 of these Project Special Provisions.

    - Analysis of the water if provided form an unknown water source.

214.04 Quality Control

All plant material shall comply with federal and state laws and regulations requiring inspection for plant diseases, pests, and weeds. Inspection certificates required by law shall accompany each shipment of plants. Clearance from the local county agricultural commissioner, if required, shall be obtained before planting trees originating outside the county in which they are to be planted. Even though trees may conform to county, state, and federal laws, the Engineer may impose additional requirements that pertain to local issues.

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Planting

The Contractor shall arrange for the inspection of plant material upon delivery to the site for compliance with the Specifications and Contract Drawings. The Landscape Architect has the right to reject plant material that does not meet Specifications until Final Acceptance. Inspection of materials is primarily for quality, size, form, variety, damage, and proper rooting but other requirements are not waived even though initial visual inspection results in approval. Rejected material shall be removed from the site within 24 hours.

The Landscape Architect has the right to cull a pre-determined quantity of plant material representative of the genus to invasively inspect for root defects. Upon discovery of defects that will impact future health and growth, other plant material may be inspected as well to determine quality of overall plant material and possible rejection.

214.05 Delivery, Storage, and Handling

(a) **Materials**. Deliver materials in original containers with tags showing genus, species and size. Protect materials from damage during delivery and while stored at site. The Engineer reserves the right to inspect containers before or after installation to verify compliance with Specifications.

(b) **Bulk Materials**

- Do not dump or store bulk materials near structures, utilities, walkways and pavements, or on existing turf areas or plants or in tree protection zones.
- Provide erosion-control measures to prevent erosion or displacement of bulk materials; discharge of soil-bearing water runoff; and airborne dust reaching adjacent properties, water conveyance systems, or walkways.
- Accompany each delivery of bulk materials with appropriate certificates.

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Planting

(c) **Trees**. Nursery stock shall be harvested and planted during the same growing season. Do not prune, except as approved by the Engineer. Protect bark, branches, and root systems from sun scald, drying, sweating, whipping, and other handling, and transportation damage. Do not bend, tie, or deliver trees in such a manner as to destroy natural shape. Root balls should be moist and provide protective covering during delivery. Plant materials delivered without protective covering may be rejected. Protect root balls from damage during digging, transferring, loading, unloading, and planting. All trees shall be labeled with a securely attached waterproof tag bearing a legible plant name. Remove all tags and flagging as directed by the Landscape Architect.

(d) Handle planting stock by the root ball only, providing support to top.

(e) Deliver trees after preparations for planting have been completed and install immediately. If planting is delayed more than 6 hours after delivery, set planting materials in shade, protect from weather and mechanical damage, and keep roots moist.

- Set balled stock on ground and cover ball with wood chips, or other acceptable material.
- Do not remove container-grown stock from containers before planting.
- Water root systems of trees stored on site with a fine-mist spray. Water as often as necessary to maintain root systems in a moist condition.
- Root balls should be stored in shade and be covered with moist mulch if stored on site for longer than 12 hours.

(f) **Project/Site Conditions**

- Vehicular accessibility on site shall be as directed as shown on approved plans or by the Engineer. Repair damage to prepared topsoil and existing surfaces, caused by vehicular access and movement during work under this Section, to original condition at no additional cost to the project.

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Planting

- Weather Limitations: Proceed with planting only when existing and forecasted weather conditions permit planting to be performed when beneficial and optimum results may be obtained. Apply products during favorable weather conditions according to manufacturer's written instructions and warranty requirements.

(g) **Coordination and Scheduling**

- Coordinate installation of planting materials during normal planting seasons for each type of plant material required, avoiding temperature extremes. Planting materials should be generally planted between April 15 and October 1, or at the direction of the Landscape Architect and City Forester.

- If irrigation is not available at the time of planting, then the Contractor is responsible for watering of all plant material at no additional cost to the project.

- Plant trees after final grades have been accepted and prior to seeding or sodding, unless otherwise authorized by the Engineer.

(h) **Examination**

- Verify actual grade elevations and dimensions of plantings and construction contiguous with new plantings by field measurements before proceeding with planting work.

- Examine areas to receive landscaping for compliance with requirements and for conditions affecting performance of work of this Section. Do not proceed with installation until unsatisfactory conditions have been corrected.

    - When conditions detrimental to plant growth are encountered, such as rubble fill, adverse drainage conditions, obstructions, or utilities, notify the Engineer before planting.

    - Verify that adequate overhead clearance exists to planting locations.

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Planting

- Suspend planting operations during periods of excessive heat, cold, and/or moisture until acceptable planting conditions exist. The contractor shall obtain approval from the Engineer when planting in temperatures above 90 degrees °Fahrenheit.

- Uniformly moisten excessively dry soil that is not workable.

- Verify that no foreign or deleterious material or liquid such as, but not limited to, paint, paint washout, concrete slurry, concrete layers or chunks, cement, plaster, oils, gasoline, diesel fuel, paint thinner, turpentine, tar, roofing compound, or acid has been deposited in soil within the work area. If contamination is present in the soil within a planting area, notify the Engineer immediately.

  - If contamination is discovered during Construction the Engineer will determine the best course of action to remediate the contamination, which may include requesting the Contractor perform the removal of contamination and replacement of clean material.

  - If contamination is determined to be the result of construction operations, Contractor is to remove contaminated material and replace with clean material at the direction of the Engineer.

- Verify final grades are completed in accordance with the drawings. Proceed with installation only after unsatisfactory conditions have been corrected and approved by the Engineer.

- Cooperate with any other contractors and trades, who may be working in and adjacent to the landscape work areas. Examine the Contract Drawings which show the development of the entire site and become familiar with the scope of all work required.

(i) **Finish Grading**. See Revision of Section 203 and Revision of Section 207 of these Project Special Provisions.

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Revision of Section 214
Planting

(j) **Preparation.**

- Protect structures, utilities, sidewalks, pavements, and other facilities, turf areas and existing plants from damage caused by planting operations. Repair damage to surrounding areas and site elements noted above resulting from planting operations at no additional cost to the project.

- Utilities: Contractor shall be responsible locating utilities and repair of utilities damaged during the work. Determine location of overhead and underground utilities and perform work in a manner that will avoid damage. Hand excavate, as required. Maintain markings until their removal is mutually agreed upon by the Contractor and the Engineer.

- Layout, stake and label all individual tree locations for approval by the Engineer prior to installing trees.

- Outline planting beds and mark plant locations within the bed(s) for approval by the Engineer prior to installing any plant material or mow bands. Make adjustments as directed by the Engineer at no additional cost to the project.

    - If formal arrangements or consecutive order of plants is indicated on the Contract Drawings, select stock for uniform height and spread, and number the labels to assure symmetry in planting.

- Prepare planting area for soil placement and mix planting soil according to Revision of Section 207 of these Project Special Provisions.

(k) **Field Quality Control.**

- Provide quantity, size, genus, species, and variety of trees indicated, complying with current applicable requirements of ANSI Z60.1 “American Standard for Nursery Stock”, and all applicable state and local rules and regulations.

- Inspection: The Contractor shall arrange for the inspection of plant material upon delivery to the site for compliance with the Specifications and Contract Drawings. The Engineer has the right to reject plant material that does not meet Specifications until Final Acceptance.

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Planting

- Measurements: Measure trees according to the requirements of the ANSI Z-160, with branches and trunks in their normal position. Do not prune to obtain required sizes. Measure main body of tree for height and spread; do not measure branches or roots tip-to-tip.

(l) **Weed Control.** Do not proceed with landscape work until weed growth has been controlled and eliminated, per Revision of Section 207 of these Project Special Provisions.

- Use pesticides only with the written approval of the Landscape Architect, and in strict accordance with manufacturer's recommendations.

(m) **Excavation for Trees and Shrubs.**

- Planting Areas: Excavate by hand, auger or with a mini excavator. Scarify or roughen sides of tree pit by hand to eliminate any glazing. Tree spades may not be used to dig tree pits.
    - Balled and Burlapped Trees:
        - Open top of root ball burlap and carefully remove soil to expose trunk flare to first order roots. Set hole depth based on bottom of root ball and base of root flare. The base of the root collar shall be 1 to 2 inches higher than finished grade.
        - Do not excavate deeper than depth of the root ball. If area under the plant was initially dug too deep, add soil to raise it to the correct level and thoroughly compact the soil directly under the root ball to prevent settling.
        - Excavate a minimum of two times as wide as ball diameter at base of pit. Excavate a minimum of three to four times as wide as ball diameter at top of pit. Slope sides of the pit as shown on the detail.

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Planting

- Container-Grown Trees and Shrubs:
  - Gently remove excess soil from top of root ball to expose root flare or top of first order root. Set plumb and in center of pit with base of root flare 1 to 2-inches above adjacent finish grades as indicated.
  - Excavate approximately two times as wide as container diameter at base of pit. Excavate a minimum of three to four times as wide as container diameter at top of pit.

- Obstructions:
  - Utilities: Notify the Landscape Architect immediately of utilities that conflict or may potentially conflict with proposed plant locations. In such cases, alternative plant locations will be determined by the Landscape Architect.
  - Notify the Landscape Architect prior to planting if unexpected rock or obstructions detrimental to trees or shrubs are encountered in excavation.
- Drainage: Notify the Landscape Architect if subsoil conditions show evidence of water seepage or retention in tree or shrub pits.

(n) **Planting Trees and Shrubs.**

- Balled and Burlapped Stock:
  - Prior to hole depth determination, open top of root ball burlap. Gently remove excess soil from top of root ball to expose root flare or top of first order root.
  - Set balled and burlapped stock plumb and in center of pit with base of root flare 1 to 2 inches above adjacent finish grades as indicated.
  - Gently remove, without damaging the root ball, all the wire basket and twine. Cut away burlap from minimum top two-thirds of the root ball, but do not remove from under ball. Remove pallets, if any, before setting. Do not use planting stock if ball is cracked, loose, or broken before or during planting operation.

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Planting

- Place backfill around ball in layers. When pit is approximately one-half backfilled, water thoroughly and allow to absorb into soil to eliminate voids and air pockets prior to placing remainder of backfill. Repeat watering until no more is absorbed. Water again after placing final layer of backfill.

- Container Grown Stock:

  - Carefully remove containers so as not to damage root balls.

  - Shave exterior 1 inch of soil and roots from root ball or until all circling roots have been removed and to promote radial fibrous roots. Use sharp spade or handsaw designed specifically for tree work to make clean, non-tearing cuts on roots.

  - Prior to hole depth determination, gently remove excess soil from top of root ball to expose root flare or top of first order root.

  - Set plants plumb and in center of pit with base of root flare and/or first order lateral root 1 to 2 inches above adjacent finish grades as indicated.

  - Place backfill around ball in layers. When pit is approximately one-half backfilled, water thoroughly and allow to absorb into soil to eliminate voids and air pockets prior to placing remainder of backfill. Repeat watering until no more is absorbed. Water again after placing final layer of backfill.

- Shrubs and perennials shall be planted outside of the root ball of trees.

(o) **Tree Wrap**. Inspect tree trunks for injury, improper pruning, and insect infestation and take corrective measures required before wrapping. Inform the Engineer of conditions prior to wrapping. Wrap trees starting at the base of the trunk and spiral cover trunk to height of first branches. Overlap wrap, exposing half the width, and securely attach without causing girdling. Use black electrical tape to secure. Do not use staples.

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Planting

- All smooth barked trees shall be wrapped with the exception of any Populus species by November 1st and removed by May 15 or per the direction of the Engineer.

(p) **Pruning of Plants.** Prune only damaged or dead branches as directed by the Landscape Architect and City Forester.

(q) **Tree Stabilization.** Install site-fabricated trunk stabilization as follows, unless otherwise indicated on Contract Drawings

- Drive wood stakes into undisturbed grade within the mulched area. Avoid penetrating root balls or root masses.
- Align tree stakes with the prevailing wind or parallel to hard surfaces.
- Securely attach specified wire to stakes.
- Support trees with specified wire and tree tie webbing from the tree trunk to each stake. Allow 1 to 2 inches of slack to avoid rigid restraint of the tree.
- For staked trees: Attach 24 inches long by 1/2 inch diameter PVC pipe flagging to each wire.
- For guyed trees: Must have prior approval from the Engineer.

(r) **Mulching**.

- Confirm with Engineer where mulching will be required for Trees, Shrubs, Perennials, and Grasses.

(s) **Antidesiccant**

- Apply antidesiccant using power spray to provide an adequate film over trunks, branches, stems, twigs, and foliage. Apply only when directed and approved by the Engineer.

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Planting

- When deciduous plants are moved in full leaf, the Engineer may direct the use of an antidesiccant at nursery before moving and again 2 weeks after planting. Antidessicant to be supplied and applied by Contractor at no additional cost to the project.

(t) **Cleaning**.

- Perform cleaning during installation of the work and upon completion of the work, to the satisfaction of the Engineer. Remove all excess materials, debris, and equipment from site. Repair any damage resulting from planting operations.

- Remove surplus soil, excess subsoil, unsuitable soil, and waste material including trash and debris generated during installation at no additional cost to the project.

(u) **Protection**.

- Protect existing utilities, paving and other facilities from damage caused by planting operations. The Contractor shall repair any damage at no additional cost to the project.

- Restrict vehicular and pedestrian traffic from planted areas. Erect temporary protection zones with signs and/or barriers as required or directed by the Engineer at no additional cost to the project.

- Erosion Control: Take measures and furnish equipment and labor necessary to control and prevent soil erosion, blowing soil and accumulation of wind-deposited materials on the site throughout the duration of work.

(v) **Maintenance**.

- The Contractor shall be responsible for maintaining all trees, plants, and groundcovers until Substantial Completion is issued.

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Planting

- Maintain trees by pruning as directed by the Engineer, cultivating, season appropriate watering, mulching, weeding, wrapping, unwrapping, restoring planting saucers, and resetting to proper grades or vertical position, as required to establish healthy, viable plantings. Monitor and control as required to keep trees free of insects and disease. Restore or replace damaged tree wrappings, stakes, guying.

- During the irrigation season (generally May through September), water may be available from on-site quick couplers. When the system is not charged, it shall be the Contractor's responsibility to supply adequate amounts of water from a water truck or other approved source. Hoses and other watering equipment shall be supplied by Contractor.

    - Watering Amount:

        - Minimum watering requirements shall be 25 gallons of water per caliper inch of every tree when temperatures are at or above 40 degrees °Fahrenheit.

        - Watering frequency shall be based on the average soil moisture level throughout the planting area.

            - An average of 6 "Average" on a soil moisture meter shall be maintained during establishment.

            - Readings shall be taken every 2 weeks at a minimum during the Construction period and at a minimum of four locations throughout the planting area.

        - Readings shall be taken at a depth of 8 inches. At time of Substantial Completion, verify that tree-watering devices are in good working order and leave them in place. Replace improperly functioning devices.

- All plants shall be true to name and meet all conditions of these specifications. Any plant that is not true to name as indicated by form, leaf, flower, or fruiting characteristics shall be replaced at the Contractor's expense.

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- Through the contract period, the Contractor shall ensure survival of the newly planted material which may include winter watering when there is not adequate precipitation to promote plant health.

- See subsection 214.06 for Landscape Establishment for maintenance requirements after Substantial Completion if establishment is included in the Contract.

214.06 Watering for Existing Trees and Landscaping

Water applied for moisture density control, pre-wetting, and as dust palliative shall be free of debris, organic matter, and other objectionable substances.

Water for landscaping shall be free from oils, acids, salts or any substance that may be harmful to plant life. Non-potable water may be accepted on a case-by-case basis as approved by Landscape Architect and City Forester.

When the water source proposed for use by the Contractor is not known, the Contractor shall provide an analysis of water samples from an approved testing laboratory. The analysis shall be provided to the Landscape Architect and City Forester prior to use.

If water source is from an existing park irrigation system, the Contractor shall be responsible to coordinate access and operation of the existing irrigation system with the Landscape Architect and City Forester. The Contractor shall provide the Landscape Architect and City Forester with the required irrigation schedule and identify the zones that need to be activated or turned off within the project limits. The Contractor shall be responsible to irrigate per the requirements of the Contract Documents.

If water source is from a hydrant, the Contractor shall be responsible to manage the use of the hydrant with the City of Grand Junction Water Services per the requirements of the Contract Documents.

If the water source is from a water truck at least one water truck shall be on site or as directed by the Engineer. Truck shall have capacity of at least 1,000 gallons or be of adequate size related to the scope of work or as directed by the Landscape Architect and City Forester. Water is to be metered for measurement, the Contractor shall provide and use an approved metering device. Monthly water usage readings either from the vehicle or from a meter are to be provided to the Landscape Architect.

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(a) Application

- Pressure type distributors or a pipeline equipped with sprinkler system.
- Moisture and Density Control: Ensure a uniform and controlled application of water without ponding or causing erosion for optimum moisture content.
- Pre-wetting: Pre-wetting material in excavation areas prior to removal for placement in embankments will be allowed as approved by the Engineer. Prior to excavation the Contractor shall drill, bore or dig test holes to the full depth of excavation to determine moisture requirements. The contractor will identify and confirm with the Engineer the areas for pre-wetting, including equipment to be used for the pre-wetting operations.
- Existing Tree Watering: The Contractor shall provide water for existing trees per the requirements of Revision of Section 207.
- Landscape Watering: The Contractor shall provide water for seeding, mulching, planting, transplanting, sodding, herbicide treatment, maintenance operations including watering during establishment periods or any other landscape related activities when called out on the Contract Drawings or Specifications.
- If overwatering occurs during any of the above operations, de-water at no additional expense to the City.

214.06 Landscape Establishment

The term Landscape Establishment shall be used interchangeably with Landscape Management and Maintenance.

(a) **Landscape Establishment Period**

- The Landscape Establishment Period shall commence from the date of Substantial Completion on an existing Contract, or a start date established by a separate maintenance contract in accordance with these Specifications. The Landscape Establishment Period shall continue for 2 years.

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(b) **Contractual Requirements**

- Limits of Work Area: All improvements and maintenance within the project work area are included unless otherwise indicated on the Contract Drawings or directed
- by the Engineer. Areas outside defined areas, as illustrated on the Contract Drawings, will be maintained by others.
- Performance of Work: The Contractor's equipment shall be accepted by the Landscape Architect prior to the commencement of the Landscape Establishment. If the Engineer finds any items unacceptable, the Contractor shall make the revisions noted by the Landscape Architect at no cost to the City.
- Scheduling / Progress Reports:
    - Scheduling: Prior to the beginning of the Landscape Establishment period, the Contractor shall submit for approval by the Engineer a detailed schedule identifying all activities which are to be performed. Examples of such commitments include the regular intervals for weed control, fertilization, pesticide applications and mowing and other operations and the month and week which are scheduled for other major activities such as reseeding and mulching. It is not the Engineer's intent to require the Contractor to meet each deadline on a specific day, but merely to identify the general time periods for such activities. The Contractor may modify the schedule due to weather conditions, providing that the Engineer is notified in advance of any changes.
    - Notification: The Contractor shall be required to notify the Engineer a minimum 48 hours in advance of all major work so the Engineer has the option of being present at the time of the work. Examples of such work are clean cultivation, mowing, spraying, seeding, mulching or other activities relating to the repair of landscape items. If proper notification is not given by the Contractor, the Engineer shall have the right to require the Contractor to reschedule any such work until such time that the Engineer is available. The above provision applies only to work which could be perceived as normal or regularly scheduled maintenance; emergency repairs do not apply.

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- Progress Reports: The Contractor shall submit quarterly progress reports. The written progress reports shall be sent to the Engineer, prior to quarterly on-site meetings, outlining the work completed, damage incurred, percent of cover, desirable and undesirable species, and problems encountered. Progress reports shall contain digital photo documentation of work.

- Site Meetings: The Contractor shall meet, on site, with the Engineer on a quarterly basis to review the project status.

- After Hours Contact: The Contractor shall provide one after hours contact, and telephone number.

- Final Report: Prior to Acceptance of this Specification, provide a final report that outlines the major actions on the site, pre-emergent applications, recent reseeding applications, any concerns about the site moving forward, and any expectations for certain areas on the site (i.e.: type of weed growth in particular areas of the site, etc.).

- Landscape Establishment Coordination: The Contractor shall coordinate maintenance operations and activities with the Engineer.

- Failure to Perform: In the event that, in the Landscape Architect's opinion, action has not been taken on the part of the Contractor to properly maintain the project, the Engineer may take whatever action deemed necessary to affect such repairs and any costs incurred will be deducted from the Contract amount.

- Licenses, Taxes, and Insurance:

  - Licenses: The Contractor agrees to obtain and pay for all licenses required by the City, State, and Federal governments that are necessary for legally conducting business. The Contractor shall maintain all licenses and permits required for maintenance activities (e.g. pesticide application).

  - Taxes: The Contractor shall pay all applicable taxes, including sales taxes on materials supplied.

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  - Insurance: The Contractor shall maintain all insurance policies in accordance with the General Contract Conditions of the contract through the entire term of the Landscape Establishment Period. During this time, the Contractor shall be responsible for watering, spraying, weeding, fertilizing and all related work as necessary to ensure that planted areas are in a vigorous growing condition.

- The Contractor shall provide all supervision, labor, material, and equipment to develop, manage, and maintain seeded areas.

- The Contractor shall protect the site during the Landscape Establishment Period. All damage that occurs to the seeded areas during the Landscape Establishment period, including vandalism, shall be repaired by the Contractor with approved materials at no additional cost to the project.

- Fill in as necessary soil subsidence that may occur because of settling, damage, or other processes.

- Apply treatments as required to keep seeded areas free of pests and pathogens or disease. Use integrated pest management practices whenever possible to minimize the use of pesticide and reduce hazards.

- Watering: All watering shall be done in such a way as to encourage establishment, deep root growth and drought tolerance.

  - Schedule watering to prevent wilting, puddling, erosion, and displacement of seed or mulch. Obtain approval of Engineer of irrigation system and schedule proposed for use.

  - Do not over-water in a manner which kills drought-tolerant components of the seed mix.

- Weed Control: Weed control shall be done for the duration of the Landscape Establishment Period and until Final Acceptance. Weed control shall be completed by one or more of the following methods approved by the Landscape Architect and City Forester:

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- Hand Removal: Hand-removal shall include the removal of all above-ground and below-ground stems, roots, and flower masses prior to the development of seed.

- Chemical Control: If necessary, apply to perennial and annual weeds by a licensed applicator trained in plant identification at no additional cost to the project. Obtain the Landscape Architect and City Forester's approval prior to applying pesticide. Apply per manufacturer's recommendations. Contractor is responsible for ensuring seed establishment and that seed is not adversely affected by pesticide applications. The Contractor shall use pesticide for specific species as recommended by CSU Agricultural Extension Service.

- Spot Application Chemical Control: Apply pesticide by hand applicator directly to invasive annual and perennial weeds. Allow a minimum 2 weeks between application and any seeding activities or per label specifications on the product used.

(c) **Tree, Shrub, and Plant Care**

- All plants are the responsibility of the Contractor during the Landscape Establishment Period. All tree stabilization materials shall be removed per the direction of the Engineer prior to Final Acceptance.

- Insect and Disease Control: Insect and disease treatment shall be by an application approved and at the direction of the Landscape Architect and City Forester as conditions require.

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- Replacement of Plants: Remove and replace dead, diseased, dying, or damaged plants (including material damaged by vehicles or vandalism) within fourteen calendar days of notification by the Landscape Architect. Upon the Landscape Architect's written approval, the Contractor may replace rejected plants later, provided that the Contractor removes all rejected plants within fourteen calendar days of the notice to replace such plants. If temperature or weather conditions are not conducive to planting, obtain approval from the Landscape Architect and City Forester prior to planting. If the rejected plants are not removed within 14 calendar days, the City may remove and replace these plants and any costs associated with the removal and replacement shall be deducted from the Contract price.

- All areas damaged by replacement operations are to be fully restored to their original condition as specified. Plant material damaged by vehicles or vandalism shall be replaced by the Contractor at no cost to the City. Guarantee all plantings to be true to name and to meet all conditions of these specifications. Any plant which is not true to name as indicated by leaf, flower form or fruiting characteristics revealed within Landscape Establishment Period shall be replaced by the Contractor at the Contractor's expense.

- Winter Watering: Winter watering is the responsibility of the Contractor throughout the Landscape Establishment Period as required to maintain plant health. Trees shall be deep root watered at a minimum interval of one time every 2 weeks when temperatures are at or above 40 degrees Fahrenheit. Refer to section above for rate. Watering may be done by water truck but must not promote or cause erosion or displacement of mulch or erosion control items.

(d) **Irrigation System and Water Management**

- Contractor shall check all existing and newly installed irrigation systems for proper operation after adjacent construction activities and any deficiencies or adjustments shall be repaired prior to the next watering cycle. Any damage to system caused by Contractor's operations shall be repaired without charge to City.

- Contractor is responsible for following all City of Grand Junction Water Services restrictions and establishment rules for new landscapes.

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- Contractor shall be responsible for providing an Establishment Watering Schedule, Transition Watering Schedule and a Maintenance Watering Schedule to the Engineer.
    - All irrigation schedules and zone controller charts shall ensure that there will be no ponding or runoff of water during any of the scheduled times.
- Prior to any plant material being installed all schedules shall be provided to the Engineer.
- Contractor shall make any modifications to the programming as requested by the Engineer.
- Initial Irrigation (Days 1-21): Plants shall be adequately watered for the first 21 days after installation or until seeds have germinated and emerged or sod has become firmly rooted.
    - Exact timing of irrigation cycles will depend on weather conditions, soil conditions, and speed of emergence of grass seed.
    - Short, frequent irrigation cycles shall be used.
    - Split cycles or the ‘cycle and soak’ feature must be employed to reduce erosion or run off in seeded areas.
    - Do not exceed 3 inches of total water per week.
    - Coordinate the irrigation system schedule and programming with the Engineer. Engineer may choose to involve other parties from the City or irrigation equipment manufacturer.
    - Contractor shall submit a meter reading before and after establishment to verify water use.
- Transition Irrigation (Days 21-60): Less frequent, but longer watering cycles will provide moisture at depths that will encourage seedlings to continue to develop and sod to develop deeper roots.

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- Allow the surface soils to dry slightly between watering to encourage deeper rooting.
- Watering shall be done utilizing historic evapotranspiration rates for the current watering month(s).

- Maintenance Irrigation (Days 61 – End of Landscape Establishment Period): Irrigate as needed to maintain an optimum stand of turf while minimizing water use.
  - Irrigation frequency shall be adjusted monthly, at a minimum, based on historical evapotranspiration rates and plant (turf and tree) water requirements.
  - It is the responsibility of the Contractor to coordinate with Engineer the programming of irrigation controllers, to properly irrigate plant materials and turfgrass.
- Time of Irrigation: Watering shall occur during the approved City-allowed water window. Coordinate times with the City Forester.
- Winterization of Irrigation System: Under the Landscape Establishment Period, the Contractor shall be responsible for winterizing the irrigation system and pumps, if applicable, for the full Landscape Establishment Period.
  - Remove water from system by use of compressed air.
  - Remove water from drip lines by opening flushing plugs.
  - Submit a meter reading after winterization of the system has occurred to Parks Water Conservation.
  - Winterization shall occur no later than October 15th unless a variance has been granted from the Engineer.
- Spring Start-Up: The Contractor shall be responsible for starting up the irrigation system in the spring (April 15).

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- Fully activate the system including controller start-up, to demonstrate that it is in full working order.
    - Any repairs that are needed because of improper winterization shall be corrected by the Contractor at no additional cost to the project.
- Correct all deficiencies and make any adjustments to ensure proper system function.
- Submit a meter reading prior to spring start-up to the Engineer.

- It shall be the responsibility of the Contractor to ensure the satisfactory operation of the entire irrigation system and workmanship within the project area. The entire system, including materials, shall be maintained to be complete and remain operable in every detail by the Contractor throughout the Landscape Establishment Period, and the Contractor agrees to make any adjustments or repair any defects occurring within the Landscape Establishment Period within 7 calendar days of notification by the Landscape Architect.
    - The Contractor shall replace any materials with manufacturer's defects at no additional cost to the project.
    - Replacement of any equipment shall match that installed and designed on the irrigation plans unless a variance is approved in writing from the Landscape Architect.
    - Problems resulting in leakage or water waste shall be repaired within 12 hours of notification.
    - If an emergency repair is necessary, the Contractor is responsible for shutting down valves on the mainline.
        - If the Contractor neglects to perform these duties within the specified time, the City may make such repairs at the Contractor's expense.

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  - In the case of an emergency, where in the judgment of the City, delay would cause serious loss or damage, repairs or replacement may be made by verbal communication and without notice being sent to the Contractor, and the Contractor shall pay the cost thereof.

  - Any disruption to the irrigation system for a period of 5 days or longer, the Contractor shall hand water the site plantings.

- Any settling of irrigation trenches/backfill material during the Landscape Establishment Period shall be repaired by the Contractor's at no additional cost to the project.

- Contract documents shall govern irrigation replacement during Landscape Establishment Period the same as new work.

- Replacements are to be made at no additional cost to the project.

- All damage to irrigation system during the Landscape Establishment Period, including vandalism, shall be repaired and/or replaced by the Contractor with approved materials at no additional cost to the project.

(e) **Inspection and Acceptance**

- Formal Inspections: The project will be inspected during the Landscape Establishment Period at Quarterly Inspections and the Contract Completion Inspection.

- Quarterly Inspections: Shall occur quarterly from the date of Substantial Completion. The review will consist of a review of all maintenance contract responsibilities. The Contractor shall keep a quarterly report to be turned in at inspections to review work done to date, including any subcontracting, frequency of schedule, notifications made, materials list, equipment list etc.

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- Contract Completion Inspection and Acceptance: The Contractor must give seven days of notice to the Engineer requesting a Contract Completion Inspection. During the inspection, the Contractor shall prepare a punch list of any defects discovered during the inspection and submit the punch list to the Engineer. When all work has been completed per the Contract Documents, the Contractor may request in writing from the Engineer Final Acceptance.

Method of Measurement

214.07 Measurement will be made by the contract unit specified for all plant material including, but not limited to Trees, Shrubs, Grasses, Perennials and Groundcovers.

Measurement for all plant material shall include the actual number of units of specified material(s) placed and accepted at the locations shown on the plans, or as directed by the Engineer, and in accordance with the Specifications.

Landscape Maintenance will not be measured but will be paid for on a lump sum basis

Basis of Payment

214.08 The accepted quantities of all plant material will be paid for at the contract unit price for each of the various items listed below that appear in the bid schedule. Payment for tree stabilization materials will not be qualified separately and shall be included in the contract unit price for trees.

Payment will be made under:

Pay Item	Pay Unit
Deciduous Tree (2 Inch Caliper)	Each
Deciduous Shrub (#1 Container)	Each
Deciduous Shrub (#5 Container)	Each
Perennials (#1 Container)	Each
Landscape Maintenance (24 months)	Lump Sum

Maintenance of Landscaping during construction will not be measured and paid for separately but shall be included in the work.

For each month that landscape maintenance is performed and accepted during the Landscape Establishment period as specified in subsection 214.04, payment for landscape maintenance will be made in installments as follows:

• Five percent of the lump sum amount will be paid for each of the eight-growing season months, March through October.

• Two and half percent of the lump sum amount will be paid for each of the winter months, November through February.

1
Section 240
Protection of Migratory Birds
Biological Work Performed by The Contractor's Biologist

Section 240 is hereby added to the standard specifications for this project as follows:

Description

240.01 This work consists of protecting migratory birds during construction.

Materials and Construction Requirements

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

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

2
Section 240
Protection of Migratory Birds
Biological Work Performed by The Contractor's Biologist

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

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

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

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Section 240
Protection of Migratory Birds
Biological Work Performed by The Contractor's Biologist

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

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

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

If birds establish a nest within the survey area, an appropriate buffer of 50 feet will be established around the nest by the CDOT biologist. This buffer dimension may be changed if determined appropriate by the CDOT biologist and approved by the Engineer.

The Contractor shall install fence (plastic) at the perimeter of the buffer. Work shall not proceed within the buffer until the young have fledged or the nests have become inactive.

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

4
Section 240
Protection of Migratory Birds
Biological Work Performed by The Contractor's Biologist

3. Tree and Shrub Removal or Trimming. Tree and shrub removal or trimming shall occur before February 15 or after August 31 if possible. If tree and shrub removal or trimming will occur between February 15 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.

(b) Work on Structures. The Contractor shall conduct work on structures in a manner that does not result in a taking of migratory birds protected by the Migratory Bird Treaty Act (MBTA). The Contractor shall not 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. If the Contract is not awarded prior to April 1 and the City has removed existing nests, then the monitoring of nest building shall become the Contractor's responsibility upon Notice to Proceed.

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

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Section 240
Protection of Migratory Birds
Biological Work Performed by The Contractor's Biologist

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 ¾ inch by ¾ 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.

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

Method of Measurement

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

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

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Section 240
Protection of Migratory Birds
Biological Work Performed by The Contractor's Biologist

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.

Pay Item	Pay Unit
Wildlife Biologist	Hour
Removal of Nests	Hour

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

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

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

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

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

1
Revision of Section 250
Environmental, Health, and Safety Management
(Radioactive Material Handling and Waste Disposal)

Section 250 of the Standard Specifications is hereby revised for this project as follows:

Subsection 250.03 shall include the following:

This project may involve work with radioactive soils associated with the Uranium Mill Tailings Radiation Control Act (UMTRCA, 1978) and the Uranium Mill Tailings Remedial Action (UMTRA) project by the Department of Energy. Uranium mill tailings may, or may not, have been identified at properties adjacent to the project area; however, per the CDPHE, radioactive contaminated soils may be present in the project location due to past uranium mill tailings uncovered in the area. Areas of excavation shall be scanned for radioactive readings. If gamma readings are at or above 20 uR/H, excavated materials shall be considered contaminated with radioactive tailings and shall be handled and disposed of properly.

Subsection 250.05 (d) Hazardous Waste Disposal shall include the following:

The Contractor shall review and implement material handling protocols for radioactive materials outlined in the CDPHE's Uranium Mill Tailings Management Plan -- for managing Title I uranium mill tailings encountered during construction activities in Western Colorado," (latest version). Upon request, a copy of this plan is available from the CDPHE's website, or from the CDOT Region 3 Environmental Unit.

As referenced in the Uranium Mill Tailings Management Plan, if on-site disposal of tailings is not feasible, off-site disposal of radioactive tailings shall be coordinated by the Health and Safety Officer (HSO) and with Mr. Michael Cosby, CDPHE Environmental Protection Specialist (Phone: 970-248-7171). Off-site disposal of radioactive material shall be approved by the Project Engineer. Work shall cease when the Monitoring Technician or Project Engineer determines that the required material handling procedures are not, or cannot, be followed (i.e. with high winds or worker non-cooperation).

2
Revision of Section 250
Environmental, Health, and Safety Management
(Radioactive Material Handling and Waste Disposal)

Subsection 250.10 add the following to the sixth paragraph:

Additional excavation of uncontaminated material to accommodate burial of tailings will be paid as unclassified excavation or shall be included in the work if the project is an embankment (CIP) project. Additional work for implementing the CDPHE's Uranium Mill Tailings Management Plan will not be paid for separately but shall be included in the work.

Payment for Hazardous Waste Disposal (Radioactive) will be made at the appropriate contract unit price for the disposal of material determined to be radioactive hazardous waste. The contract unit price will be full compensation for furnishing all materials, labor, equipment, tools, storage containers for transport, containerization of material for up to 60 days, and incidentals necessary to complete this work. This includes all handling of the material, loading for disposal, unloading for disposal, and borrow material required for replacement of excavated material disposed of off-site.

Hazardous Waste Disposal (Off-site Disposal). Transport costs and disposal fees will be paid for by a planned force account in accordance with subsection 109.04

Pay Item	Pay Unit
Environmental Health and Safety Management	Lump Sum
Monitoring Technician	Hour
Health and Safety Officer	Hour
Hazardous Waste Disposal (Radioactive)	Cubic Yard
F/A Hazard Waste Disposal (Off-Site Disposal)	F/A

1
Revision of Section 304
Aggregate Base Course

Revise Section 304 of the Standard Specifications for this project as follows:

Subsection 304.02 shall include the following:

Materials for the subbase shall be Aggregate Base Course (Class 6) as shown in subsection 703.03.

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

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

1
Revision of Section 403
Hot Mix Asphalt

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

Subsection 403.02 shall include the following:

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

Table 403-1

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

2
Revision of Section 403
Hot Mix Asphalt

Table 403-1							
Property	**Test Method**	**Value For Grading**					
Dust to Asphalt Ratio Fine Gradation Coarse Gradation	CP 50			0.6 – 1.2 0.8 – 1.6			0.6 – 1.2 0.8 – 1.6
Note: AI MS-2 = Asphalt Institute Manual Series 2 Note: Mixes with gradations having less than 40% passing the 4.75 mm (No. 4) sieve shall be approached with caution because of constructability problems. Note: Gradations for mixes with a nominal maximum aggregate size of one-inch or larger are considered a coarse gradation if they pass below the maximum density line at the #4 screen. Gradations for mixes with a nominal maximum aggregate size of 3/4” to 3/8” are considered a coarse gradation if they pass below the maximum density line at the #8 screen. Gradations for mixes with a nominal maximum aggregate size of #4 or smaller are considered a coarse gradation if they pass below the maximum density line at the #16 screen. *Fractured face requirements for SF may be waived by RME depending on project conditions.							

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

3
Revision of Section 403
Hot Mix Asphalt

Table 403-2

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

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

4
Revision of Section 403
Hot Mix Asphalt

Patching shall be to the depth of the surrounding existing pavement, as directed by the Engineer. The all lifts shall conform to the requirements of HMA (Grading SX) (100) (PG 76-28). The minimum and maximum HMA lift thicknesses shall be 1.5 and 3 inches. All patching shall be per the Engineer's direction.

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

Subsection 403.03 shall include the following:

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

Delete subsection 403.05 and replace with the following:

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

Payment will be made under:

Pay Item	Pay Unit
Hot Mix Asphalt (Patching)(Asphalt)	Ton

Aggregate, asphalt recycling agent, asphalt cement, additives, hydrated lime, and all other work and materials necessary to complete each hot mix asphalt item will not be paid for separately, but shall be included in the unit price bid. When the pay item includes the PG binder grade, any change to the submitted mix design optimum asphalt cement content to establish production targets on the Form 43 will not be measured and paid for separately, but shall be included in the work. No additional compensation will be considered or paid for any additional asphalt cement, plant modifications and additional personnel required to produce the HMA as a result in a change to the mix design asphalt cement content.

5
Revision of Section 403
Hot Mix Asphalt

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

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

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

1
Revision of Section 608
Detectable Warnings

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

Subsection 608.01 shall include the following:

This work includes the installation of detectable warnings on concrete curb ramps as shown on the plans.

Subsection 608.02 shall include the following:

Detectable warnings on curb ramps shall be truncated domes of the dimensions shown on the plans. Truncated domes shall be manufactured as a pattern on cast iron plates that are designed to set in wet concrete or shall be one of the products approved for use as detectable warnings listed on CDOT's Approved Products List. Pavers will not be allowed.

The domes and their underlying surface shall have a discernible contrast of color from the adjacent surface. The contrasting colors shall not be black and white. Truncated dome panel color shall be as approved by the Engineer. Concrete for curb ramp construction shall never be stained or have color added.

When cast iron plates are used, prior to the start of work, the Contractor shall submit appropriate documentation from the manufacturer verifying that the contrast has been met, along with a sample cast iron plate, to the Engineer for approval.

Subsection 608.03 shall include the following:

(g) **Detectable Warnings for curbs ramps.**

1. Cast Iron Plates. Prior to installation of the cast iron plates, concrete conforming to subsection 608.02 shall be installed and consolidated as a base for the cast iron plates. The concrete shall be placed to a thickness that will allow the base surface of the cast iron plates to be at the same elevation as the adjacent concrete. The cast iron plates shall be embedded into the plastic concrete in accordance with the manufacturer's specifications.

2
Revision of Section 608
Detectable Warnings

Subsection 608.05 shall include the following:

Detectable warnings on new curb ramps, including cast iron plates, alternate materials, and all other work and materials necessary for fabrication, transport, saw cutting, removal of concrete and other installation will not be measured and paid for separately, but shall be included in the cost of item 608 Concrete Curb Ramp.

1
Revision of Section 610
Median Cover Material (Patterned Concrete)

Section 610 of the Standard Specifications is hereby revised for this project as follows:

Subsection 610.02 shall be revised to include the following:

Patterned concrete color shall be integral Davis color #10134 “Terra Cotta” with a powdered release agent “Brickform Black Antique Release”, RA-900 or equivalent. The color hardener shall not be a dry shake-on surface treatment type but shall be integral to the concrete mixing process. Color selection must be approved by the Engineer. Contractor shall submit color samples (as many as required) for approval.

Pattern shall be Matcrete M-161 “UK Cobblestone”. Surface texture is irregular rather than smooth. Contraction joints shall be saw cut and spaced at a maximum of 10 feet. Contraction joints shall be placed in the joints in the running bond pattern.

1
Revision of Section 613
Conduit

Revise Section 613 of the Standard Specifications for this project to include the following:

Description

This work includes furnishing and installing new High-Density Polyethylene (HDPE) and Polyvinyl Chloride (PVC) electrical conduit and fittings for use with fiber optic cable, electrical conductors, and communications cabling.

Materials

All materials furnished, assembled, fabricated, or installed under this item shall be new, Underwriters Laboratories (UL) listed, corrosion resistant and National Electric Code (NEC) compliant. Materials shall be submitted to the Project Engineer for approval.

Electrical conduit shall be suitable for underground use and shall be Schedule 80 in the diameters, quantities and depths shown on the plans. Electrical conduit and fittings shall be UL listed.

HDPE conduit and fittings shall be certified by the manufacturer as meeting American National Standards Institute (ANSI) ANSI/UL 651A. PVC conduit and fittings shall be certified by the manufacturer as meeting ANSI/UL 651.

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

HDPE conduit used for CDOT fiber optic communications shall be orange. If an additional spare CDOT conduit is installed in a common trench, the additional conduit shall be blue. HDPE conduit for electrical conductors shall be red. PVC conduit shall be labeled to match HDPE colors.

2
Revision of Section 613
Conduit

Each conduit shall be equipped with a pull tape installed with or after all cabling for future use. The pull tape shall have a minimum tensile strength of 1800 pounds. The pull tape shall include a continuous 22-gauge tracer wire. Splices in the pull tape and tracer wire may occur inside manholes and pull boxes and shall not be permitted inside conduit. Pull tape shall be installed in conduits with electrical conductors carrying 50V or less

For CDOT conduit, a minimum 12-gauge tracer wire shall be included in at least one CDOT conduit within all conduit banks containing CDOT conduit. The tracer wire shall be orange in color. In conduit banks with multiple conduits, the 12-gauge tracer wire and pull tape shall be installed in the same conduit with the fiber optic cable.

A two-inch wide warning tape shall be provided in each conduit trench. The warning tape and lettering shall be chemically inert, resistant to acid and alkali, designed for installation underground, and be constructed of polyethylene plastic. The warning tape shall have a minimum nominal thickness of 4 mil. The warning tape shall be red with the repeated phrase “CAUTION ELECTRIC LINE BURIED BELOW” if any conduit in the trench is designated for use with electrical conductors. The warning tape shall be orange with the repeated phrase “CAUTION FIBER OPTIC CABLE BURIED BELOW” for all other trenches. The text shall be black printed in a single line.

Construction Requirements

All conduit and fittings installation shall conform to the NEC.

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

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

Prior to construction, the Contractor shall submit a trenching and boring plan to the Engineer for approval. The plan shall show the limits of the planned work areas and the areas of anticipated disturbance. All disturbances outside the planned work areas created by Contractor’s operations shall be restored to their original condition at the Contractor’s expense.

3
Revision of Section 613
Conduit

During construction operations, the contractor shall maintain boring logs that include the depth at specific distances along the bore. Boring logs shall be submitted on a weekly basis. All trenches shall be backfilled by the end of each shift. Material from trenching operations shall be placed in a location that will not cause damage or obstruction to vehicular or pedestrian traffic or interfere with surface drainage.

The Contractor shall be responsible for damage due to over-excavating a trench and heaving damage to the existing asphalt and concrete mat, caused by equipment directly and by dislodging rocks or boulders. All damage from over-excavation and heaving shall be repaired at the Contractor's expense. The Contractor shall bear the cost of backfilling all over-excavated areas with the appropriate backfill material approved by the Engineer.

The Contractor shall restore all surface materials to their original condition or better, including but not limited to pavement, sidewalks, sprinkler systems, landscaping, shrubs, sod, and native vegetation that is disturbed by the conduit installation operation. All restoration shall be included in the cost of the conduit.

The Contractor shall use corrosion resistant splice couplings that comply with the NEC. All associated work to splice the conduit shall be included in the cost of the item. The coupling technology used to connect conduit ends shall require no special tools and form a watertight, airtight seal. The breaking force between segments shall exceed 250 pounds. Conduit splices shall be kept to a minimum and all such locations shall be approved and inspected by the Engineer and the authority having jurisdiction. Additional pull boxes shall not be substituted for conduit splices.

When conduit is trenched or plowed, warning tape shall be installed a minimum of 12 inches directly above the conduit and a minimum 12 inches below final grade.

Conduits not containing cable shall be plugged with a plug that is watertight, removable, mechanical and equipped with a connection to secure a pull rope.

4
Revision of Section 613
Conduit

Conduits containing cable shall be plugged with durable and reusable split type plugs, fabricated without corrosion resistant parts. The plugs shall allow easy removal and reinstallation around in-place cables. Split type plugs shall provide a watertight and airtight seal of at least 22 pounds per square inch. They shall be installable by hand without using tools and without damaging the cable. All plugs shall be correctly sized to fit the conduit being plugged.

Conduit shall be plugged at all termination points including but not limited to pull boxes, manholes, controller cabinets, structures, poles, and node buildings.

All open conduit ends shall be plugged at the end of each shift with an approved plug.

All conduits shall terminate between two inches and four inches from the bottom or sides of pull boxes and manholes.

All conduit runs containing fiber optic cable shall have a limited number of bends. The sum of the individual bends on a single conduit run between any two pull points shall not exceed 270 degrees. No individual bend shall exceed 90 degrees. All conduit bends shall have a minimum radius of 24 inches. HDPE conduit minimum bending radius shall conform to Table 354.24 in the NEC.

New conduits may be installed into existing pull boxes, manholes and cabinet bases, and the Contractor shall carefully excavate around the existing facility and install the new conduit as shown on the plans. The Contractor shall not damage the existing facility or its contents. If the existing conduit, pull box, lid and concrete collars are damaged during conduit installation, the Contractor shall restore the damaged item or section to current CDOT requirements at no additional cost to the project. For locations where conduit is installed into existing pull boxes, manholes, and cabinet bases that are located in asphalt, concrete, or slope pavement, patching with asphalt, concrete or slope pavement will be required and shall be included in the cost of the conduit. The Contractor shall reseal all new conduit entries into an existing manhole with grout.

Conduit shall always enter a pull box, manhole, cabinet base and all other structure types from the direction of the run only.

5
Revision of Section 613
Conduit

A conduit bell end shall be installed on each conduit in pull boxes, manholes, cabinets, and pole bases. All conduits ends shall be free from sharp edges and burrs.

Conduits stubbing up through pole foundations shall be installed within 4 inches of the center of the caisson.

The Contractor shall refer to Revision of Section 625 Construction Survey specifications for documentation requirements.

Method of Measurement

For the Electrical Conduit (Bored) and Electrical Conduit (Plastic) pay items, conduit will be measured by the actual linear foot of conduit installed and accepted.

Conduit shall also include all groundwork, lubricants, anchors, bands, skids, sweeps, pull rope, pull tape, copper tracer wire, adaptors, fittings, splice couplings, conduit plugs, foam sealant, installation equipment, mounting brackets and hardware, structure anchors, adhesives, labor and all other items necessary to complete the work.

Basis of Payment

Electrical Conduit unit prices shall be full compensation for the work shown on the Plans and described above.

Payment will be made under:

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

1
Revision of Section 613
Pull Boxes - General

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

Materials

Subsection 613.02 shall include the following:

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

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

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

Construction Requirements

Subsection 613.07 shall include the following:

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

2
Revision of Section 613
Pull Boxes - General

For Electrical Lighting Type Two Pull Box – Provide a heavy-duty, TIER 22, polymer concrete, bottomless pull/splice box with bolted cover flush mount in-grade with a minimum of 12 inches deep pea gravel base under box for drainage. Provide 12 inches wide x 4 inches deep concrete ring/collar around box to maintain level position in open landscape. Provide ground rod in pull box and bond 1#4 soft drawn bare copper conductor from ground rod through the grounding conduit in the light standard raceway to the lug at the back of the handhole in the light standard. The Contractor shall install 1#12 AWG locate wire and 1,250 lb nylon pull string with footage tape in all spare and empty conduits.

The Contractor shall be responsible for repairing damages caused by boring, trenching, cutting, drilling, etc. or performance of any related work in this contract area. Contractor shall furnish and install all barrier, pavement, landscape materials, etc. to restore the construction site outside of the pavement included in the roadway improvements to restore the construction site to pre-construction conditions.

Method of Measurement

Subsection 613.11 shall include the following:

Pull Boxes will be measured by the actual number that are installed and accepted, and will include base, lid, fiber optic cable brackets, excavation, backfill, concrete collars, and 3/4 inch granite gravel. Pull Boxes will also include the removal and patching of pavement, sidewalks, curb and gutters, and their replacement in kind to match existing grade.

Basis of Payment

Subsection 613.12 shall include the following:

Pay Item	Pay Unit
Type Two Pull Box	Each
Type Four Pull Box	Each
Type Five Pull Box	Each

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

1
Revision of Section 613
Proof Conduit

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

Description

This work consists of locating, verifying continuity and ability to re-pull existing cable through the conduit, clearing if necessary, and installing pull tape and tracer wire in existing conduit in accordance with the Plans.

Materials

Each conduit shall be equipped with a pull tape installed with or after all cabling for future use. The pull tape shall have a minimum tensile strength of 1800 pounds. The pull tape shall include a continuous 22-gauge tracer wire. Splices in the pull tape and tracer wire may occur inside manholes and pull boxes and shall not be permitted inside conduit. Pull tape shall be installed in conduits with electrical conductors carrying 50V or less.

A minimum 12-gauge tracer wire shall be included in at least one conduit within all conduit banks. The tracer wire shall be orange in color. In conduit banks with multiple conduits, the 12-gauge tracer wire and pull tape shall be installed in the same conduit with the fiber optic cable.

Construction Requirements

All conduit and fittings installation shall conform to the NEC.
The contractor shall locate all pull boxes in the conduit run. Not all pull boxes are shown in the plans.

The Contractor shall immediately notify the Engineer if conduit is found to be damaged or is damaged during construction activities.

Upon verification of acceptable condition of the existing conduit run, the conduit end shall be immediately sealed using an approved conduit plug.

For existing conduits that contain existing cabling, the contractor shall protect existing cables in place while proofing conduit unless otherwise notes on plans. Contractor shall be responsible for repairing any damage they cause to existing cabling.

2
Revision of Section 613
Proof Conduit

Method of Measurement

Proof Conduit will be paid for by the linear foot of existing conduit that is cleared and cleaned, verified for acceptable condition, with pull tape installed through the sections of existing conduit. Proof conduit shall include, all groundwork, pull box excavation, pull cord, copper tracer wire, adapters, fittings, conduit plugs (for conduits both with and without fiber optic cable), equipment, labor, and all other items necessary to complete the work.

Basis of Payment

Payment will be made under:

Pay Item	Pay Unit
Proof Conduit	Linear Foot

1
Revision of Section 613
Wiring

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

Subsection 613.09 shall include the following:

All wiring shall be 600 Volt rated, Type: Conform to the applicable UL and ICEA Standards for the use intended. Copper conductors with 600-volt insulation unless otherwise specified or noted on the drawings. Stranded conductors for No. 8 and larger shall not be allowed unless otherwise specified or noted on the drawings. Aluminum conductors will not be permitted.

(1) Conductor Insulation: Comply with NEMA WC 70/ICEA S-95-658

(2) Insulation: Type XHHW, THWN-2/THHN insulation minimum unless otherwise specified or noted on the drawings.

(3) Size: No. 12 minimum unless otherwise specified or noted on the drawings. Not less than NEC requirements for the system to be installed.

(4) Color Coding: Phase, neutral and ground conductors color-coded in accordance with NEC. Connect all Conductors of the same color to the same phase conductor as follows:

120/240V-1PH-3W Color coding shall be:
- (1) Line 1 = Black
- (2) Line 2 = Red
- (3) Neutral = White
- (4) Ground = Green

(5) Unless otherwise authorized, the multiple system of electrical distribution shall be used. Conductors of the size and material specified shall be installed for control wiring, device wiring, main circuit wiring, ground wiring, service entrance wiring, and all other wiring necessary for a complete installation.

(6) Conductors shall be sized to prevent a voltage drop of more than three (3) percent per feeder run. All conductors shall be installed in conduit.

(7) All power circuits shall include an insulated green grounding conductor.

2
Revision of Section 613
Wiring

(8) A complete grounding system shall be installed for the entire electrical installation. Grounding shall consist of ground cables, conduits, grounding rods, wire or strap, and ground fittings, as required by the National Electrical Code.

Type THWN-2 conductors shall be used for all underground conduit runs. Leave sufficient lengths of branch conductors to allow conductor splices to be extracted from handhole for maintenance. Type XHHW shall be used for the service entrance conductors (service laterals).

Use manufacturer-approved pulling compound or lubricant where necessary; compound used must not deteriorate conductor or insulation. Do not exceed manufacturer's recommended maximum pulling tensions and sidewall pressure values.

Use pulling means, including fish tape, cable, rope, and basket-weave wire/cable grips, that will not damage cables or raceway.

Factory-fabricated connectors and splices of size, ampacity rating, material, type, and class for application and service indicated.

Connectors, splices, and terminations shall be 600 volt rated, and rated for the installation locations as follows:

(1) Exterior above grade weatherproof boxes and wireways installation of connectors and splices.
   a. Shall be UL listed to 486D insulated for use in damp/wet locations.
   b. Shall have silicone-based protection against moisture and corrosion.
   c. The connector shall be rated at 105-degree C.
   d. Shall be listed for exterior above grade installation.

(2) Exterior below grade installation of connectors and splices.
   a. Shall be UL listed to 486D and ANSI C119.1 insulated for use in submersible locations.
   b. Temporary submersion up to 6’ deep and direct burial applications.
   c. Dual rated Copper/Aluminum class B and C conductors.
   d. Operating temperature rating -45 degree C to 90 degree C (-49 degree F to 194 degree F).
   e. Material: 6061-T6 aluminum alloy

3
Revision of Section 613
Wiring

f. Insulation: High dielectric strength EPDM rubber for increased chemical and abrasion protection.
g. Multi-lug configurations to match the number of conductor connections required. One conductor per lug or port.
h. Removable port plugs: field cut wire insert cones to fit wire size, secures entry port closures to ensure debris prevention.
i. Pre-filled with oxide inhibitor.

Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A-486B.

Make splices, terminations, and taps that are compatible with conductor material.

Wiring at Handholes and Outlets: Install conductor at each handhole or outlet, with at least 12 inches (300 mm) of slack to allow removal from handhole or outlet for maintenance.

A complete grounding system shall be installed for the entire electrical installation. Grounding shall consist of:

1. ground cables,
2. conduits,
3. grounding electrodes,
4. wire or strap, and
5. ground fittings, as required by the NEC.

Permissible grounding electrodes shall be:

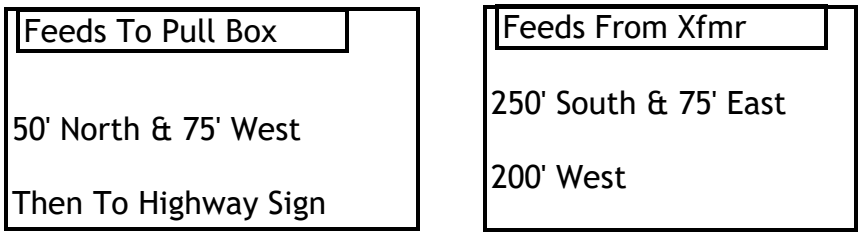
1. ground rods,
2. concrete-encased electrodes,
3. grounding plates and grounding rings.

Alternative grounding electrodes per the NEC shall be approved by the Project Engineer before installation.

4
Revision of Section 613
Wiring

All electrical conductors shall be identified and tagged as follows: electrical conductor cable tags shall be located at each splice termination. The tags shall be attached with cable ties. The information shall be written on the tag with a permanent marker. The information shall include the direction and approximate length of the cable, and the feeder or circuit destination (line and load sides). Each incoming (line side) conductor shall be individually color coded with one tape mark; each outgoing conductor (load side) shall be coded with two tape marks.

Example:



Basis of Payment

613.15 shall include the following:

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

Pay Item	Pay Unit
Wiring	LS

The lump sum price bid for wiring will be full compensation for all electrical circuitry necessary to complete the electrical installation and traffic signal modifications. All conductors in conduit, regardless of type, are part of the wiring item and will not be measured and paid for separately.

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

1
Revision of Section 613
Meter Power Pedestal – Cold Sequence

Section 613 is hereby added to the CDOT Standard Specials for this project as follows:

613.02 (h) Shall include the following:

Roadway lighting materials shall conform to Section 715 and shall be compatible with the requirements of the local agency having jurisdiction.

(a) **Foundation**. Concrete Foundation Pads shall be cast-in-place or precast concrete. A complete foundation includes concrete, reinforcing steel, grounding electrode, connector bolts, and anchor bolts. See plans and details for additional requirements for the meter power pedestal's foundation pad. The contractor shall provide a structural engineered stamp drawing for the meter power pedestal's concrete foundation pad.

613.09 Lighting Control Center, Meter Power Pedestal and Secondary Service Pedestals. Shall include the following:

b.) **Meter Power Pedestal** - Provide a commercial meter/power pedestal and route raceway out to the electrical loads as shown on the plans and details. Provide an all-in-one meter power pedestal with meter, meter t-handle disconnect, a grounding rod system, a built-in maintenance duplex GFCI receptacle, service entrance rated, copper bus panel with main and branch breakers as indicated on the panel schedules and connections to the power supply and all interconnection conductors and raceways as shown on the plans and details.

The Contractor shall provide an electrical permit from the state of Colorado with no additional cost to the project. All inspections and corrections of work required by the state inspector shall be performed by the Contractor at no additional cost to the project.

2
Revision of Section 613
Meter Power Pedestal – Cold Sequence

The Contractor shall coordinate with Utility's (application of electrical service form) to setup and acquire service at each meter shown on the plans.

The Contractor shall furnish and install an engraved brass tag label indicating the address of the meter. Brass tag label shall conform to Electric Utility specifications.

"Arc-Flash Hazard Warning" labels shall be furnished and installed by the electrical contractor per the National Electric Code NEC 110.16 and the NFPA 70E, and all other labels required by NFPA 70.

Basis of Payment

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

Pay Item	Pay Unit
Meter Power Pedestal	Each

All work necessary and incidental to the installation of the Meter Power Pedestal as shown in the plans will not be measured and paid for separately but shall be included in the work.

1
Revision of Section 613
Lighting

Section 613 is hereby added to the CDOT Standard Specials for this project as follows:

Subsection 613.04 Concrete Foundation Pads and Light Standard Foundations shall include the following:

Light Standard Foundation - The contractor shall provide an engineered stamped drawing for the pre-cast concrete foundation for the specified "LP" Type luminaire and light standard with all requirements shown on details and complying with all requirements of the pole manufacturer's anchor bolt size and bolt circle dimensions with (2) 2 inch conduits (1) in and (1) out of the foundation for power wiring and (1) ½" conduit for ground rod wiring. Provide steel re-enforced, Class B, (Minimum 4,500 psi) concrete and with a design wind speed of 120 MPH minimum.

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

Luminaire (LED) (6,000 Lumens) – Provide LED luminaire type "LP" mounted on a 16'-7" 4-inch diameter, straight light standard. Both luminaire and light standard shall be Black. Install light standard and luminaire mounted on a pre-cast light standard concrete foundation. See pay item 613-40010 Light Standard Foundation. This pay item shall include the Luminaire, Arm, and Light Standard.

The Contractor shall be responsible for repairing damages caused by boring, trenching, cutting, drilling, etc. or performance of any related work in this contract area. Contractor shall furnish and install all landscape materials, etc. to restore the construction site to pre-construction conditions.

Basis of Payment

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

Pay Item	Pay Unit
Luminaire (LED) (6,000 Lumens)	Each
Light Standard Foundation	Each

1
Revision of Section 614
LED Pedestrian Signal Face (Countdown)

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

Description

Subsection 614.01 shall include the following:

This work includes the installation of Light Emitting Diode (LED) Pedestrian Signal Faces with countdown timers as shown in the Contract.

Materials

Subsection 614.08 (i) shall include the following:

Pedestrian signal faces with countdown timers shall meet the following requirements:

(1) The dimensions of the signal housing and the LED symbols, as well as moisture and dust resistance requirements, shall be in accordance with the current Institute of Transportation Engineers Pedestrian Traffic Control Signal Indicators (ITE PTCSI) Standards.

(2) Signal housing shall be aluminum, yellow in color and “clam-shell” mounted.

(3) The countdown module shall have an internal conflict monitor to prevent any possible conflicts between the Hand/Person signal indications and the time display. The display shall not count down during a Solid Hand indication.

(4) LED symbols shall be solid icons and shall provide uniform light dispersion such that the “pixel” effect is minimized. Lettered or outline symbol styles will not be permitted.

(5) The Hand/Person configuration shall provide clear and distinct lamination where either symbol is in use.

(6) The LED module shall be rated for use in an ambient operating temperature range of -40ºF to 165ºF.

2
Revision of Section 614
LED Pedestrian Signal Face (Countdown)

(7) The signal shall meet the National Electrical Manufacturers Association (NEMA) Standard Transportation Systems 2 (TS2) for voltage surge protection, and shall have an automatic reset in case of a power outage.

Construction Requirements

Subsection 614.09 shall include the following:

LED Pedestrian Signal Face (Countdown) shall be secured in place using ¾-inch Type 201 stainless steel banding.

Method of Measurement

Subsection 614.13 shall include the following:

LED Pedestrian Signal Face (Countdown) will be measured by the actual number of units that are installed and accepted.

Basis of Payment

Subsection 614.14 shall include the following:

Pay Item	Pay Unit
Pedestrian Signal Face (16) (Countdown)	Each

1
Revision of Section 614
Accessible Pedestrian Signal

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

Subsection 614.01 shall include the following:

This work consists of the construction of an accessible pedestrian signal system at locations as shown on the plans.

Delete subsection 614.08 (g) and replace with the following:

The Accessible Pedestrian Signal (APS) shall be an audible-tactile pedestrian signal system and shall consist of all electronic control equipment, mounting hardware, push buttons and signs designed to provide both a pushbutton with a raised, vibrating tactile arrow on the button as well as a variety of audible indications for differing pedestrian signal functions.

The APS shall meet the following requirements:

(a) Current Version of the Manual of Uniform Traffic Control Devices (MUTCD), Chapter 4E – Pedestrian Control Features.

(b) NEMA TS 2 Section 2.1 requirements for Temperature and Humidity, Transient Voltage Protection and Mechanical Shock and Vibration.

(c) IEC 61000-4-4; 4-5 Transient Suppression requirements.

(d) FCC Title 47, Part 15, Class A, Electronic Noise requirements.

The APS pushbutton enclosure shall meet the NEMA 250 – Type 4X enclosure requirement. As specified on the plans, all APS shall receive power and control data from a single Central Control Unit (CCU) in the traffic signal cabinet.

2
Revision of Section 614
Accessible Pedestrian Signal

Upon installation the APS shall meet the following functional requirements:

(a) APS functional requirements. The APS shall have the following functional features:

1. The APS shall be programmable and adjustable. Programming and adjustments shall be made using a laptop computer or vendor supplied hand held infrared device with password security. Infrared device shall be capable of setting/updating all push button stations on the intersection from a single push button station (global updating). No additional hardware or equipment shall be required. The APS shall be fully compatible with the three latest versions of the Windows operating platform. The programmable features shall be:

   (a) Push-button locator tone. The system shall have, at a minimum, three programmable locator tones.

   (b) Walk and Wait audible message. The system shall have five (5) Walk Sound Choices (Field Selectable) and three (3) Ped-Clearance Sound Choices (Field Selectable).

   (c) Audible crossing beacon. System shall be able to mute sounds on all crosswalks except activated crosswalk (selectable feature).

   (d) Vibrating tactile arrow. The arrow/button shall vibrate during the WALK period, following a button push.

   (e) Independent minimum and maximum volume limits for the Locator Tone, Walk and Audible Beacon features.

   (f) Extended Push Activation

      1. Extended Push Activation shall have the ability to extend the WALK time and provide an audible Direction of Travel message. Activation shall be programmable from one to six seconds. A customized Information Message shall be an optional feature with Extended Push Activation.

3
Revision of Section 614
Accessible Pedestrian Signal

2. All audible features shall emanate from the pedestrian pushbutton housing. The APS shall utilize digital audio technology, having a minimum 12-bit sample at a 16k Hz sample rate. Total harmonic distortion shall be less than 3 percent at 75 decibels. The APS shall provide independent ambient sound adjustment for the Locator Tone feature. The APS shall allow for Locator Tone volume to be set below the ambient noise level. All sound levels shall adjust automatically utilizing an internally mounted, interval ambient sensing microphone, in accordance with the MUTCD.
3. The APS shall monitor the WALK condition for conflict operation. As a standalone unit, the APS shall disable the Walk functionality should a conflict be detected.
4. The APS system shall log cumulative call data. The data shall be date and time stamped, and shall be accessible via laptop.
5. The system shall provide a programmable audible Wait message when the button is pushed. The message shall only annunciate once per actuation.
6. All Sounds for all push button stations shall be synchronized.
7. System shall have multiple language capability (selectable feature)
8. System shall be able to play emergency preemption message

(b) Central Control Unit (CCU):

1. The CCU shall power at least 16 APS.
2. The CCU shall control at least 16 APS.
3. The CCU shall be logically configurable to assign any APS to one of 16 traffic phases.
4. The CCU shall receive pedestrian phase WALK, DONT WALK and Clearance inputs from an SDLC input.
5. The CCU shall be able to self-test all APS and put a corresponding phase into recall should an APS assigned to a phase fail the self-test.
6. The CCU shall provide optically isolated general purpose inputs.

4
Revision of Section 614
Accessible Pedestrian Signal

7. The CCU shall be used with a 4-cable interface harness assembly.
8. The CCU shall have internal storage to log several hundred events with a date-time stamp for each event.
9. The CCU shall have an internal real-time clock capable of setting in the field and propagating the time to each connected APS.
10. The CCU firmware shall be updatable via either Wi-Fi or Ethernet. There shall be not requirement for the IC chips or module hardware to be removed or exchanged in order to complete the firmware update.
11. The CCU shall monitor PED interval conflicts and switch affected APS to an OFF state when a conflict occurs.
12. The CCU shall meet NEMA 250 – Type 1 enclosures requirements.
13. The CCU shall have a backlit LCD screen and button interface to allow placing test calls and display status.
14. The CCU shall provide remote user access to cumulative call data logs via Ethernet connection.

(c) Push Button Assembly (PBA):

1. The PBA shall be a single assembly containing an ADA compliant, vibro-tactile, directional arrow button, weatherproof audible speaker and informational sign with optional placard braille messages. The PBA housing shall not incorporate any plastic or polycarbonate parts.
2. The PBA tactile arrow shall be 2 inches in length and shall be field adjustable to one of four directions.
3. The pushbutton shall utilize Piezo switch technology rated at greater than twenty million operations. Vibro-tactile operation shall pulse at 20 Hz with a minimum 0.003-inch displacement against a 2 pound applied force.

5
Revision of Section 614
Accessible Pedestrian Signal

4. The PBA assembly shall be capable of mounting on a curved or flat surface utilizing either machine screws or bolts or banding type mounting hardware. The PBA shall accommodate mounting to a minimum 2-inch diameter pole.
5. Push Button Frame Adaptor and MUTCD Supplemental shall include standard plaque R10-3(e) (9”X15”).
6. Push button station frame shall be made of cast aluminum with mounting holes to hold a 9”x15” Pedestrian Sign.
7. Pedestrian Button Casting(s) shall be yellow.

Subsection 614.10 shall include the following:

The Contractor shall install the APS and CCU in accordance with manufacturer’s recommendations.

The Contractor shall install the CCU inside the Traffic Signal Cabinet, to be powered by the AC supply mains (115 VAC).

Subsection 614.13 shall include the following:

The Accessible Pedestrian Signal units will be measured as the actual number that are installed and accepted. When multiple buttons are on the same pole, each button will be measured separately.

Subsection 614.14 shall include the following:

Payment will be made under:

Pay Item	Pay Unit
Accessible Pedestrian Signal	Each

Payment will be full compensation for all work, materials and equipment required to install a fully operational APS in accordance with these specifications.

6
Revision of Section 614
Accessible Pedestrian Signal

Payment for Accessible Pedestrian Signals shall be full compensation for all work, materials and equipment required to install one Accessible Pedestrian Signal.

1
Revision of Section 614
Pedestrian Push Button (Special)

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

Description

Subsection 614.01 shall include the following:

Pedestrian Push Button (Special) includes all work and materials necessary to adjust the height and reach of proposed pedestrian push buttons.

Construction Requirements

Subsection 614.09 shall include the following:

Push buttons shall be mounted at a height of 42 inches above the finished sidewalk surface. Where necessary the height may be increased to a maximum of 48 inches. The side reach shall not be greater than 10 inches. Where specified, the Contractor shall install an extender bracket at ADA ramp locations. When extender brackets are necessary at ADA ramp locations they shall not be greater than 10 inches in length. If the Contractor discovers site constraints such that the height and reach dimensions cannot be met, he shall notify the Engineer. Height and reach requirements are shown in the attached detail.

Method of Measurement

Subsection 614.13 shall include the following:

The quantity to be measured for “Pedestrian Push Button (Special)” shall be the actual number of proposed push buttons that are adjusted for ADA compliance or via an extender bracket. Pedestrian push button extenders will be measured and paid by the actual number of units that are installed and accepted.

Basis of Payment

Subsection 614.14 shall include the following*:*

Pay Item	Pay Unit
Pedestrian Push Button (Special)	Each

1
Revision of Section 622
Bus Stop Amenities

Revise Section 622 of the Standard Specifications for this project as follows:

Description

Subsection 622.01 shall include the following:

This work consists of the installation of bus stop amenities, which include a bus shelter, benches, trash receptacles, and other bus stop-related items as designated in the plans.

Materials

Subsection 622.02 shall include the following:

Bus Stop Amenities shall be Brasco International (Brasco). Mesa County has entered into a price agreement with Brasco for Bus Stop Amenities, and the Contractor may use pricing from that agreement. The Brasco contact is listed below:

Sean Loewe
Phone: 313-393-0393 x202
Email: sloewe@brasco.com

The Mesa County Regional Transportation Planning Office (RTPO) representative for the project is listed below:

Andrew Gingerich
Phone: 970-683-4339
Email: andrew.gingerich@mesacounty.us

2
Revision of Section 622
Bus Stop Amenities

Bus Stop (Enhanced) shall include the following:

Item	Description	Notes
EC-0512-C-0-SL-ACTG-0-0-0	5’ x 12’ Eclipse Series Aluminum Structure Cantilever Style; Partial Side Walls with Overhanging Roof Powder Coat Painted Aluminum Finish—RAL Color TBD 3/8” Clear Tempered Safety Glass Sloped Flat Roof with Blade Rafters and Bronze Acrylic Glazing	Color TBD by RTPO
Freight for EC-0512	Freight for 5’ x 12’ Eclipse Series Aluminum Structure (contractor shall verify if there are additional shipping costs for other items)	
Ad Box	4’ x 6’ Non-Lit Advertising Display Box	
Solar Lighting Package	Solar Lighting Package with Roof Mount Solar Panel, Battery, Solar Controller, and LED Lighting for General Illumination	
Solar Accent Lighting	Solar Powered LED Accent Lighting	
Map Case	24” x 36” Non-Lit Display Case with Grommet Attachment Through Glass	
Vinyl Graphic	Vinyl Graphic Applied To Glass (artwork design by RTPO)	Design provided by RTPO
12’ Aluminum Banner	12’ Powder Coat Painted Aluminum Banner with Vinyl Graphics (artwork design by RTPO)	Design provided by RTPO
6’ Eclipse Bench	6’ Eclipse Bench with HDPE Bench Slats and Two Seat Dividers	Installed inside the shelter
Ad Bench	6’ Eclipse Ad Bench with HDPE Bench Slats, Two Seat Dividers, and Advertising Display Backrest	
Eclipse TR	32 Gallon Eclipse Aluminum Trash Receptacle with Bonnet Lid—Color TBD	Color TBD by RTPO
Hoop Bike Rack	Single Hoop Aluminum Bike Rack	

3
Revision of Section 622
Bus Stop Amenities

Bus Stop (Standard) shall include the following:

Item	Description	Notes
EC-0512-C-0-SL-ACTG-0-0-0	5’ x 12’ Eclipse Series Aluminum Structure Cantilever Style; Partial Side Walls with Overhanging Roof Powder Coat Painted Aluminum Finish—RAL Color TBD 3/8” Clear Tempered Safety Glass Sloped Flat Roof with Blade Rafters and Bronze Acrylic Glazing	Color TBD by RTPO
Freight for EC-0512	Freight for 5’ x 12’ Eclipse Series Aluminum Structure (contractor shall verify if there are additional shipping costs for other items)	
Ad Box	4’ x 6’ Non-Lit Advertising Display Box	
Solar Lighting Package	Solar Lighting Package with Roof Mount Solar Panel, Battery, Solar Controller, and LED Lighting for General Illumination	
Solar Accent Lighting	Solar Powered LED Accent Lighting	
Map Case	24” x 36” Non-Lit Display Case with Grommet Attachment Through Glass	
Vinyl Graphic	Vinyl Graphic Applied To Glass (artwork design by RTPO)	Design provided by RTPO
12’ Aluminum Banner	12’ Powder Coat Painted Aluminum Banner with Vinyl Graphics (artwork design by RTPO)	Design provided by RTPO
6’ Eclipse Bench	6’ Eclipse Bench with HDPE Bench Slats and Two Seat Dividers	Installed inside the shelter
Eclipse TR	32 Gallon Eclipse Aluminum Trash Receptacle with Bonnet Lid—Color TBD by RTPO	Color TBD by RTPO
Hoop Bike Rack	Single Hoop Aluminum Bike Rack	

4
Revision of Section 622
Bus Stop Amenities

Construction

Subsection 622.05 shall include the following:

The contractor shall coordinate with the RTPO representative to determine colors listed as "TBD" in the tables in Subsection 622.02. The Contractor shall coordinate with the RTPO representative to receive the vinyl graphic and 12' aluminum banner artwork designs listed in the tables in Subsection 622.02, and shall notify the RTPO representative 2-weeks (minimum) in advance of the artwork and banner designs being required.

Before ordering, the contractor shall submit a complete materials list for Approval to the RTPO representative.

All items shall be installed per the manufacture's recommendations and requirements.

Method of Measurement

Subsection 622.27 shall include the following:

The quantities to be measured under this section will be the actual number of complete bus stop amenity locations installed, completed and accepted, comprising of all items included in each site in accordance with this specification and as shown in the plans.

Basis of Payment

Subsection 622.28 shall include the following:

Payment will be made under:

Pay Item	Pay Unit
Bus Stop Amenities (Enhanced)	Each
Bus Stop Amenities (Standard)	Each

1
Revision of Section 622
Wheel Stop (Concrete)

Revise Section 622 of the Standard Specifications for this project as follows:

Description

Subsection 622.01 shall include the following:

This work consists of the installation of Wheel Stop (Concrete) at the locations shown on the Plans.

Materials

Subsection 622.02 shall include the following:

Wheel Stop (Concrete) shall be 6-foot-long portable concrete curbs. Concrete for Wheel Stop (Concrete) shall be Class B and meet the requirements of Section 601. Wheel stops shall be sealed with concrete sealer.

Wheel Stop (Concrete) shall contain two ¾-inch knockouts to allow for the Wheel Stop (Concrete) to be secured to the ground and shall include all materials required to secure the Wheel Stops to the ground per the manufacturer's recommendations.

Wheel Stop (Concrete) shall be securely fastened to the ground. Wheel Stop (Concrete) shall be installed per the Plans.

Method of Measurement

Subsection 622.27 shall include the following:

Wheel Stop (Concrete) will be measured by the actual number installed and accepted and will include all materials and labor required to complete the work.

2
Revision of Section 622
Wheel Stop (Concrete)

Basis of Payment

Subsection 622.28 shall include the following:

Payment will be made under:

Pay Item	Pay Unit
Wheel Stop (Concrete)	Each

1
Revision to Section 623
Irrigation System

Section 623 of the Standard Specifications for this project shall be deleted and replaced with the following:

Description

623.01 This work consists of furnishing and constructing an irrigation system per these specifications and in conformity with the lines and grades shown on the plans or established.

Materials

623.02 General. All materials and equipment incorporated into the irrigation system shall be new and of recognized standard quality. In the case of computer software or hard coded instructions, the latest available version from the manufacturer is required. All materials shall be of a standard line from a name brand manufacturer or must be approved.

623.03 Backflow Preventer. Size and type indicated on Drawings; Brass or iron construction with 150 psi working pressure.

623.04 Automatic Controller (2-Wire). Size and type shown on Drawings; mounted as detailed.

- Single Station Decoders (2-Wire) - Size and type shown on Drawings; mounted as detailed.
- Install decoders and wire per manufacture recommendations and requirements.
- Grounding for all decoders and 2-wire decoder cable, to be per manufactures recommendations and requirements. Minimum one grounding assembly per every 500' of wire or every 15TH) decoder and at all ends of 2-wire decoder cable run.

623.05 Remote Control. Remote control shall consist of an FM, AM, UHF, or VHF radio transmitter/receiver pair with a minimum range of one mile in congested areas and shall include battery charger and replacement battery. The receiver shall plug into a receptacle installed in the enclosure or panel of the automatic controller. Remote control shall be capable of turning on/off any station in any order. Remote control shall comply with all applicable FCC rules and regulations.

2
Revision to Section 623
Irrigation System

623.06 Electrical Control Wiring

. Low Voltage – (2-Wire Decoder Cable)

. Electrical Control Wire - UFUL approved, Paige Wire P7072D 12/2 or as per manufactures requirements, direct burial copper wire to operate system as designed. If multiple controllers are utilized, refer to wire routing plan for individual wire runs. If multiple controllers are utilized, each controller shall have its own 2-wire decoder cable run, controllers cannot be connected with same 2-wire run. Loop five (5) feet minimum of 2-wire cable into all valve boxes. Control Wire connections and splices shall be made with 3M DBY or King 600 DBY/R direct bury splice, or as required by the controller manufacturer.

. High Voltage – Type required by local codes and ordinances, of proper size to accommodate needs of equipment serviced.

. Wire colors shall be:

Table 623-1
Control Wiring Color Key

Wire Color	Plant Materials
Black	Master (power)
Purple	Spares
Green	Turf
Brown	Tree
Yellow	Perennials
Red	Shrubs
White	"common" or ground wire

623.07 Flow Sensor. Size and type shown on Drawings.

623.08 Drip Emitters and Bubblers.

. Drip Tubing - Manufactured of flexible vinyl chloride compound conforming to ASTM D1248, Type 1, Class C, Category 4, P14 and ASTM D3350 for PE 122111C.

3
Revision to Section 623
Irrigation System

. Fittings - Type and diameter recommended by tubing manufacturer.

. Drip Valve Assembly - Type and size shown on Drawings.

. Wye Strainer - Plastic construction with 150 mesh nylon screen and 1/2 inch blowout assembly.

. Control Valve - 2 way, solenoid pilot operated type made of synthetic, non-corrosive material; diaphragm activated and slow closing. Include freely pivoted seat seal; retained (mounted) without attachment to diaphragm.

. Pressure Reducing Valve - Plastic construction as detailed.

. Emitters - Single port, pressure compensating, press on type.

. Soil staples – install on all on-surface installations, spaced 3 feet on center for sandy soils, 4 feet on center for loam soils, and 5 feet on center for clay soils

. Bubblers - Rainbird 1400 Series or approved equal.

623.09 General Piping

. Pressure Supply Line (from tap on city mains to winterization tee or Stop and Drain valve prior to backflow prevention unit) – Type “K” Soft Copper (3/4” – 2 1/2”) and ductile iron (3” and larger).

. Pressure Supply Line (from point of connection, winterization tee or Stop and Drain valve and through backflow prevention unit) - Type "K" Hard Copper (3/4” – 2 1/2”) and ductile iron (3” and larger).

. Pressure Supply Lines (downstream of backflow prevention units) – Type "K" Hard Copper (3/4” – 2 1/2”), Schedule 40 PVC BE (1" - 2 1/2"), HDPE DR11 (1" - 2 1/2") as noted on plans and schedule.

. Non-pressure Lines - Schedule 40 PVC BE, 1” minimum size, as noted on plans.

. Sleeving - Class 160 PVC, HDPE, DR11 as noted on plans and schedule.

. Drip Tubing - Toro Dura-Pol EHD 1645 3/4" with .050 inch wall thickness.

4
Revision to Section 623
Irrigation System

623.10 Copper Pipe & Fittings

. Copper Pipe - Type K, hard tempered or annealed coil.

. Fittings - Wrought copper, solder joint type.

. Joints - Soldered with solder, 45% silver, 15% copper, 16% zinc, and 24% cadmium and solidus at 1125~F and liquids at 1145~F.

623.11 Brass Pipe & Fittings

. Brass Pipe - 85% red brass, ANSI Schedule 40 screwed pipe.

. Fittings - Medium brass, screwed 125-pound class.

623.12 Plastic Pipe and Fittings. All pipe shall be identified with the following indelible markings: manufacturer's name, nominal pipe size, schedule or class of pipe, pressure rating in pounds per square inch, date of extrusion, and NSF seal of approval.

. Identification Markings:

.Identify all pipe with following indelible markings:

. Manufacturer's name.

. Nominal pipe size.

. Schedule of class.

. Pressure rating.

. NSF (National Sanitation Foundation) seal of approval.

. Date of extrusion.

. Solvent Weld Pipe - Manufactured from virgin polyvinyl chloride (PVC) compound in accordance with ASTM D2241 and ASTM D1784; cell classification 12454-B, Type 1, Grade 1.

.Fittings - Standard Weight, Schedule 40, and injection molded PVC; complying with ASTM D1784 and D2466, cell classification 12454-B.

. Threads - Injection molded type (where required).

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Revision to Section 623
Irrigation System

. Tees and ells - Side gated.

. Threaded Nipples - ASTM D2464, Schedule 80 with molded threads.

. Teflon Tape – All PVC male threaded fittings and nipples, excluding marlex fittings, shall receive wrapping of Teflon tape applied to threaded surfaces per pipe manufacturer’s recommendations.

. Joint Cement and Primer - Type as recommended by manufacturer of pipe and fittings.

. HDPE Pipe - Pipe shall be manufactured from a pipe resin which meets ASTM D 3350-05 with a minimum cell classification of 445474C. Pipe shall be manufactured to the dimensions of ASTM F-714. The service factor to determine the pressure rating shall be 0.63. Pipe shall have a minimum pressure rating of: DR 11, 200 psi. The pipe shall contain no recycled compounds except that generated in the manufacturer's own plant from resin of the same specification from the same raw material. HDPE FITTINGS:

. Butt Fusion Fittings - Fittings shall be made from HDPE pipe resin meeting ASTM D 3350-05 with a minimum cell classification of 445474C, Molded Butt Fusion Fittings shall have a manufacturing standard of ASTM D-3261. Molded & fabricated fittings shall have the same pressure rating as the pipe unless otherwise specified on the plans. Fabricated fittings must have the same pressure rating as the pipe; a DR less than the pipe shall be used. Fabricated fittings are to be manufactured using a Data Logger to record temperature, fusion pressure, and a graphic representation of the fusion cycle shall be part of the Quality Control records.

. Electrofusion Fittings - Fittings shall be made from resin or pipe meeting ASTM D 3350-05 with a minimum cell classification of 445474C; Electrofusion Fittings shall meet the manufacturing standard of ASTM F-1055. Fittings shall have the same pressure rating as the pipe or higher unless otherwise specified on the plans.

6
Revision to Section 623
Irrigation System

. Transition fittings shall be used for transition to other pipe materials (1/2" – 4", Male NPT x Butt Fusion) and meet dual standards 4710/3608 HDPE Resin, Black; Red Brass or 304 SS Stainless Steel.

. Flanged and Mechanical Joint Adapters - Flanged and Mechanical Joint Adapters (4" – 12") shall be made from materials containing resin that meets ASTM D 3350-05 with a minimum cell classification of 445474C.

. Transitional Stiffeners shall meet 304 SS Stainless Steel.

. Flexible Plastic Pipe - Manufactured from virgin polyethylene in accordance with ASTM D2239, with a hydrostatic design stress of 630 psi and designated as PE 2306.

. Fittings – Insert type manufactured in accordance with ASTM D2609; PVC Type 1 cell classification 12454-B.

. Clamps - All stainless steel worm gear screw clamps. Use 2 clamps per joint on 1-1/2 inch and 2 inch fittings.

623.11 Valves.

(a) Mater Valve. Size and type shown on Drawings.

(b) Electronic Control Valves. Size and type shown on Drawings having manual flow adjustment and manual bleed nut.

. Single station 2-wire decoder.

(c) Gate Valves

. Gate Valves for 3/4 inch through 2-1/2 Inch Pipe - Brass construction; solid wedge, IPS threads, and non-rising stem with cross operating handle.

. Gate Valves for 3 Inch and Larger Pipe - Iron body, brass or bronze mounted AWWA gate valves with a clear waterway equal to full nominal diameter of valve; rubber gasket or mechanical joint-type only. Valves shall be able to withstand a continuous working pressure of 200 psi and be equipped with a square operating nut and resilient wedge. Provide pipe restraints on gate valves 3 inches or larger as detailed.

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Revision to Section 623
Irrigation System

(d) Quick-Coupler Valves. Brass two-piece body designed for working pressure of 120 PSI; operable with quick coupler. Equip quick coupler with locking.

623.12 Valve Box

. Gate Valves, Quick Coupling Valves, Drain Valves, Drip Line Blow-out Stubs, and Wire Splice or Stub Box - Carson Brooks #910-10 as detailed.

. 1 inch through 2 inch Control Valves, Master Valves, Pressure Regulating Valves and Communication Cable Splice box, Sub-meters - Carson Brooks #1419-12 box as detailed.

. Drip Valve Assemblies and Flow Sensors - Carson Brooks #1220-12 box Carson Brooks #1730-12 box as detailed.

623.12 Sprinkler Heads - As indicated on Drawings. Fabricated riser units in accordance with details on Drawings - with fittings and nipples of equal diameter as riser inlet in sprinkler body.

623.13 Strainer. Strainer shall be a wye pattern type with a polypropylene body. The strainer shall contain a 150 mesh stainless-steel screen accessed by removing a threaded non-corrosive cap. Strainer shall be flushed via a ball valve located on the strainer.

Construction Requirements

623.14 General. Irrigation systems shall be installed in conformity with applicable local codes. Information on the plans shows general locations only. The Contractor shall establish exact locations of all irrigation equipment to fit field conditions, and locations will be approved by the Engineer before start of construction. Contractor shall maintain and protect the approved staking layout. Before purchase of any irrigation equipment, the Contractor shall submit a list of suppliers and specification sheets for all irrigation components. This submittal must be approved by the Engineer before any equipment purchase is made. At the submittal stage, all changes in equipment shall be brought to the attention of the Engineer.

8
Revision to Section 623
Irrigation System

623.15 Site Review. At least 14 days before the start of irrigation work on the project, a Pre-construction Conference shall be held. During irrigation installation, monthly meetings shall be held. Those in attendance shall be a representative of the Contractor staff, the Landscape and Irrigation Subcontractors, the Engineer, and a CDOT Landscape Architect. A written description of work methods, and time schedules and milestone dates shall be presented. The Contractor shall notify the Engineer before mainline pressure testing, coverage tests, and final review. The Contractor shall provide two radio transceivers with necessary personnel or remote-control devices to operate automatic controllers during coverage tests and final review.

623.16 Excavation and Backfill. Excavation and backfill shall conform to the requirements of Section 206 and subsection 703.08(b) (Class 2 Structure Backfill), except that compaction of backfill outside of the roadway prism may be done by water flooding, with the approval of the Engineer. The Contractor shall maintain bottoms of trenches flat to permit all piping to be supported on an even grade. Where lines occur under paved areas, dimensions shall be considered to be below the subgrade. All mainline pipe shall be bedded in sand to allow a minimum of 2 inches of sand on all sides. Rock larger than 1 inch shall not be placed in the backfill material.

Where it is necessary to excavate adjacent to existing trees or shrubs, the Contractor shall use all possible care to avoid injury to the plant root system.

623.17 Pipe Installation. Minimum cover for irrigation pipe shall be as follows:

Table 623-2
Minimum Cover for Irrigation Pipe

Mainline Pipes	24 inches below finished grade
Lateral Pipes	18 inches below finished grade
Pipe under roadways	30 inches below subgrade finished grade
Irrigation sleeving	30 inches below finished grade

9
Revision to Section 623
Irrigation System

All pipes under roadways shall be encased in a steel pipe sleeve that shall be jacked or placed in a hole bored under present roadways, or in a steel or plastic pipe sleeve placed by trenching on new construction. At least 4 inches of clearance shall be provided between lines and at least 4 feet of clearance between lines of other trades. Parallel pipes shall not be installed directly over any other line. Manual drain valves shall be installed at all low points in the mainline. Minimum grade of pipe to drains shall be 3 inches per 100 feet. Plastic threaded fittings shall be assembled using teflon tape applied to male pipe threads only. Threaded fittings shall be kept to a minimum. The Contractor shall tape all open ends of the pipe during installation to prevent entry of any foreign matter into the system.

623.18 Kick Blocks. Concrete kick blocks shall be installed when the following conditions occur on 4 inch or greater mainline pressure pipe:

(1) 22 degree or greater change in pipe direction.

(2) Change in pipe size.

(3) Dead ends in pipes.

623.19 Wiring. All 24-volt wire to automatic control valves and flow sensor wiring shall be installed at a minimum depth of 28 inches below finished grade. Power source wire shall conform to subsection 715.07.

Wiring shall be installed at the side of and under mainline whenever possible. When more than one wire is placed in a trench, the Contractor shall tape wires together with electrical tape at intervals of 15 feet or less. A 24-inch coiled expansion loop shall be provided every 300 feet along wire run, before controller enclosure, at each connection, and at directional changes. Each automatic controller shall have its own separate ground wire, colored green. Wiring between automatic controller and automatic control valves or sensors shall be continuous. At locations where splicing is approved by the Engineer, moisture proof splices shall be made in a valve box. Two extra wires shall be installed along the entire mainline pipe from each automatic controller to the last automatic control valve. Wire splices shall be compatible in effectiveness to wire coating. All wire under roadways shall be encased in a separate steel or plastic conduit.

Wires not following the mainline shall be installed using open trench excavation. Wiring shall not be installed using a vibratory plow.

Tubing shall be installed to an even grade in an open trench. Flush valve assemblies shall be installed at all ends of the drip lateral lines.

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Before backfilling, all capillary drip lines shall be staked with an approved staple, 6 feet on center.

623.20 Drip Systems. Drip lateral lines and capillary tubing shall be installed after 5 gallon and larger plant materials are in place and finished grade is established. The Contractor shall tape all open ends of pipe during installation to prevent entry of debris into the system. All pipe shall be cut with a knife or blade type pipe cutter to prevent entry of pipe debris into the system; a saw shall not be used.

Tubing shall be installed to an even grade in an open trench. Flush valve assemblies shall be installed at all ends of the drip lateral lines.

Before backfilling, all drip lines shall be staked with an approved staple, 6 feet O.C.

623.21 Valve Boxes. All valve boxes shall be installed flush with the finished grade. A "branding iron" type of tool shall be used to imprint the automatic control valve number (letters and numbers 2 inches high) on the valve box lid. Valve numbering system shall be as indicated on the plans. Geotextile filter fabric shall be placed under valve box and extend a minimum of 4 inches beyond bottom rim of valve box. Valves shall be grouped so that three or four valves are located together. Valves shall not be installed in low areas subject to standing water.

623.22 System Flushing. After all irrigation pipelines and valves are in place and connected, and before installation of irrigation sprinklers, rotary heads, etc., the Contractor shall thoroughly flush all lines with water at system operating pressure.

623.23 Pressure and Coverage Tests, and Adjustments. After installation of valves, pipe, and fittings, mainlines shall be inspected for leaks after a minimum 90 psi static pressure (or point-of-connection static pressure if higher) has been maintained for four hours in a hydro static test. Mainline pipes shall not be buried until completion of the test. If the system does not pass the test, the Contractor shall detect and correct problems until the system reaches the acceptable test standard. This test shall be passed before payment for the pipe.

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Irrigation System

Gasketed pipe shall be tested using a volumetric (make up water) test and leak rates supplied by the pipe manufacturer and commonly accepted in the industry.
The Contractor shall perform coverage tests in the presence of the Engineer, after the irrigation system is completed and before any planting, seeding or sodding to assure that all irrigated areas are watered completely and uniformly. The Contractor shall make all necessary adjustments to provide required coverage as directed.
Drip lateral and emitter coverage tests shall be performed after planting and before backfilling of lateral lines and emitters.

623.24 Inspections. Inspections by the Engineer or the Engineer's representative can be made at any point during construction. Milestone progress dates shall be established at the Pre-construction Conference and 72-hour notice shall be given by the Contractor when a milestone event is approaching.

623.25 Irrigation As-Constructed Plans. The Contractor shall dimension from two permanent reference points, building corners, sidewalk corners, road intersections or any permanent structures, the location of the following items:

(1) Routing of irrigation mainline.

(2) All drip and sprinkler automatic control valves.

(3) Quick coupling valves, isolation gate valves, and manual drain valves.

(4) Other related equipment as directed.

The Contractor shall provide an accurately detailed irrigation as-constructed layout of the irrigation system at the same scale as the design plans and on 24-inch by 36-inch waterproof medium within 90 days after installation is complete and before notice of substantial landscape completion as defined in subsection 214.04. An in-progress as-constructed plan shall be kept on the construction site at all times and available for impromptu review by the Engineer or the Engineer's representative.

Provision of the final as-constructed plan is a condition for final acceptance and release of retainage.

All changes in the irrigation system layout, including lateral layout, shall also be indicated on irrigation as-constructed plans.

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The Contractor shall provide finalized as-constructed plans to the Engineer at the time of Final Landscape Acceptance.

623.26 Maintenance Manuals and Training. Before Final Landscape Acceptance, the Contractor shall provide two individually bound maintenance manuals to the Department for the irrigation system, and shall train the owner's maintenance personnel in the proper operation of all irrigation equipment, including winterization procedures. Each manual shall contain the following:

1. Index sheet, stating irrigation contractor's name, address, telephone number and name of person to contact.
2. Duration of equipment or component warranty and warranty form.
3. Equipment list providing the following for each item:
   A. Manufacturer's name
   B. Make and model number.
   C. Name and address of manufacturer's local authorized distributor
   D. Spare parts list in detail
   E. Detailed operating and maintenance instructions for major equipment.
4. Descriptions of all installed materials and systems in sufficient detail to permit maintenance personnel to understand, operate, and maintain the equipment.

   A printout of the as-constructed plans shall be provided, showing the area covered by that automatic controller. The area of coverage of each automatic control valve shall be identified using a distinctly different pastel color, drawn over the entire area of coverage.
   Following approval of charts by the Engineer, they shall be hermetically sealed between two layers of plastic sheet, each 20 mils thick.

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623.27 Warranty. The Contractor shall warranty the irrigation system for the duration of the Landscape Establishment period specified in subsection 214.06. To ensure proper operation of the system, the Contractor shall perform, as required, warranty activities including, but not limited to the following:

1. Inspection of the system and correction of system leaks, improperly operating valves, clogged emitters, malfunctioning automatic controllers and other components.
2. Maintaining optimum sprinkler coverage.
3. Adjusting sprinkler head elevations relative to finish grade.

In an emergency the Contractor shall correct all deficiencies within 24 hours of notification by the Engineer. The Contractor shall perform irrigation system inspections at least once per week and after each mowing. The Contractor shall make corrections as necessary to ensure proper operation. The Contractor shall document each inspection in writing and submit it to the Engineer.

623.28 Final Landscape Acceptance. Before final landscape acceptance is granted, the Contractor shall perform an overall operation and pressure test and confirm the irrigation system is correctly functioning. This includes two weeks on “Flow” to be verified by the CDOT “Central Computer”. The Contractor shall inspect every sprinkler and as necessary, raise or lower those sprinklers that are no longer at the proper elevation relative to the finish grade as shown in the plans. The Contractor shall complete Spring start-up (pressurization) and repair all damage to the irrigation system.

623.29 Cleanup. Upon completion of the work, the Contractor shall restore ground surfaces to required elevations and remove excess materials, debris, and equipment from the site.

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623.30 Keys and Repair Components. Three keys shall be furnished for manual operation of valves. When valves require different kinds of keys, three keys of each kind shall be furnished. Keys shall be of adequate length and made of non-corrosive metal.

The following sprinkler components shall be furnished for system repair:

1. Two Automatic Control Valves.
2. Two Manual Drain Valves.
3. Two Valve Boxes.
4. Two Mainline Isolation Valves.
5. Two Quick Coupler Valves.

623.31 Irrigation Scheduling. The Contractor shall submit recommendations for the project's initial irrigation operating schedule for optimum plant establishment to the Engineer.

Method of Measurement

623.32 Automatic controller will be measured by the number of units of each size installed and accepted, including concrete pad, conduit, bolts, enclosure, ground wire, and all other items necessary to complete the work as shown on the plans.

Drip emitters will be measured by the number of multi-outlet emitters and shall include the capillary tubing, tubing stakes, enclosure box, and debris caps. Each drip emitter shall have six outlets.

Emitter valve assemblies will be measured by the number of units of each size installed.

Vacuum breakers, backflow preventers, strainers, and all other valves of the various types and sizes, including fittings, valve boxes, copper risers, and sleeves, will be measured by the number of units installed and accepted.

Quick couplers, check valves, swing joints and fittings, will be measured by the number of units installed and accepted.

Plastic and copper pipe will be measured by the linear foot installed and will include the cost of the detectable underground marking tape.

Power source wire and 24-volt wire will be measured by the linear foot installed.

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Water meter pay item includes all appurtenant fittings, valves, meter pit, and related equipment.

Basis of Payment

623.33 The accepted quantities will be paid for at the contract unit price for the various items below that appear in the bid schedule.

Payment will be made under:

Pay Item	Unit
1 INCH COPPER PIPE TYPE "K"	**Linear** Foot
1 INCH PLASTIC PIPE, SCH40 LATERAL	Linear Foot
2 INCH PLASTIC PIPE, SCH40 MAINLINE	Linear Foot
2 INCH PLASTIC PIPE, DR11 HDPE MAINLINE	Linear Foot
2 INCH PLASTIC PIPE, CL160 SLEEVE	Linear Foot
4 INCH PLASTIC PIPE, CL160 SLEEVE	Linear Foot
4 INCH PLASTIC PIPE, DR11 HDPE SLEEVE	Linear Foot
2 INCH PLASTIC PIPE, DR11 HDPE SLEEVE	Linear Foot
IRRIGATION BUBBLER (1402 W/ SWING PIPE & FITTINGS)	Each
DRIP EMITTER TUBING, 3/4 INCH NSF#80 POLY	Linear Foot
DRIP (XBCV)	Each
1" INCH EMITTER VALVE ASSEMBLY	Each
1 INCH BACKFLOW PREVENTER, LF825YA W/SBBC-22AL ENCLOSURE	Each
1 INCH MANUAL DRAIN VALVE	Each
1 INCH AUTOMATIC CONTROL VALVE ASSEMBLY, PEB SERIES W/ DEC	Each
1 INCH AUTOMATIC MASTER CONTROL VALVE, EFB-CP SERIES W/DEC	Each
CONTROL WIRE 2-WIRE CABLE	Linear Foot
2-WIRE GROUNDING ASSEMBLY	Each
POWER SOURCE WIRE	Linear Foot
1 INCH QUICK COUPLER VALVE, 44-LRC	Each

Pay Item	Unit
2 INCH GATE VALVE	Each
VALVE BOX STANDARD, 1419-12-4 W/LIDS & LOCKING BOLTS	Each
VALVE BOX ROUND, 910-10-4 W/LIDS & LOCKING BOLTS	Each
VALVE BOX JUMBO, 1220-12-3L W/LIDS & LOCKING BOLTS	Each
WEATHER STATION, WR2-RFC W/ POST	Each
1 INCH FLOW SENSOR, FS-100-P WITH SENSOR DECODER	Each
60 STATION 2-WIRE CONTROLLER, W/ SS-PEDESTAL PER GJ PIPE	Each
1 INCH WATER METER W/ VAULT & PIT	Each
3/4 INCH DRIP LINE BLOW-OUT & OPERATIONAL INDICATOR	Each

Water lines will be paid for as provided in Section 619

Kick blocks, unions, fittings, filter fabric, valve access sleeves, valve boxes, piping and wire inside boxes, keys, and aggregate for valves will not be paid for separately but shall be included in the work.

Structure excavation and backfill including compaction and water will not be paid for separately but shall be included in the work.

Concrete pad, bolts, enclosure, ground wire, and all other items necessary to complete the work shall be included in the price of the automatic controller.
Capillary tubing, tubing stakes, enclosure box and debris caps shall be included in the price of the drip emitter.

System flushing and adjustment, pressure and coverage tests, maintenance manuals, and training will not be paid for separately but shall be included in the price of the work.

The backflow preventer enclosure and pad will not be paid for separately but shall be included in the work.

Detectable Underground Marking Tape will not be paid for separately but shall be included in the work.

Advisor Message Receiver pagers and handheld two-way radios will not be paid for separately but shall be included in the work.

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

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Revision of Section 625
Construction Surveying

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

The following paragraphs are added to subsection 625.04 Contractor Surveying:

The Contractor's Surveyor shall conduct an as-constructed survey of all project installed/relocated utility lines as shown in the UTILITY PLAN. This includes utility lines that are installed for the project/relocated by OTHERS and lines that are installed for the project/relocated by the Contractor. The as-constructed survey shall be completed in accordance with the CDOT Survey Manual Chapter 6, Section 6.14.

The CDOT Survey Manual Chapter 6, Section 6.14.2, Item 4 is hereby deleted and replaced with:

4. A three dimensional (containing northings, eastings and elevations) data is to be submitted to CDOT's utility database. The Contractor's surveyor will collect observations in accordance with Section 2.1 – 3.3 below, General Observation Standards, Accuracy requirements (Table 1), projections/coordinate systems and equipment requirements are outlined in Sections 1.1, 1.2, 1.3 and 1.4 below. Points and Polylines collected with the appropriately named survey codes identified in Section 2, Table 2 below. Each point observed file shall contain a descriptor of what that point represents, see Section 2.1.

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Construction Surveying

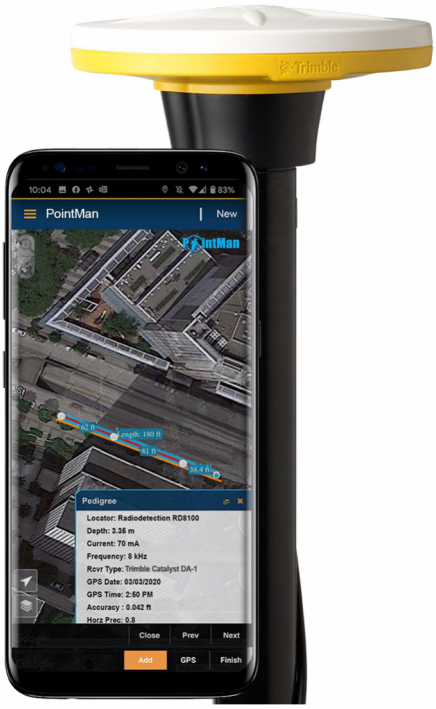
1. CDOT Utility as-constructed/Out of Service requirements, data content and accuracy

1.1. All utility installations, within CDOT Right of Way (ROW), shall be collected using CDOT's mobile application (PointMan). If required please contact CDOT at cdotpointman@gmail.com to obtain login and password information. Download the PointMan mobile application through the Apple Store (iOS) or Google Play (Android). Finally, watch the following quick start guide, the video can be found at the following link: https://youtu.be/X-tMvnK7vZw

1.2. High accuracy equipment requirement:







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Supported GNSS Receivers	
 Trimble DA1 (Catalyst)	
 Trimble R2 (RTK)	
 Trimble R8 (current version is R8s)	Supported Software
 Trimble R10	Android 7.1
 Trimble R12	iOS 12 & Up
 Trimble SPS985 (current version is SPS986)	HTML Web Browser
 Blue Star RTK or Emlid Reach RS2 RTK 	

One of the following GNSS receivers is acceptable to use at this time with CDOT's mobile application. Deviation from CDOT's list of accepted GNSS receivers must be requested and approved by the department in writing prior to submission of as-built data.

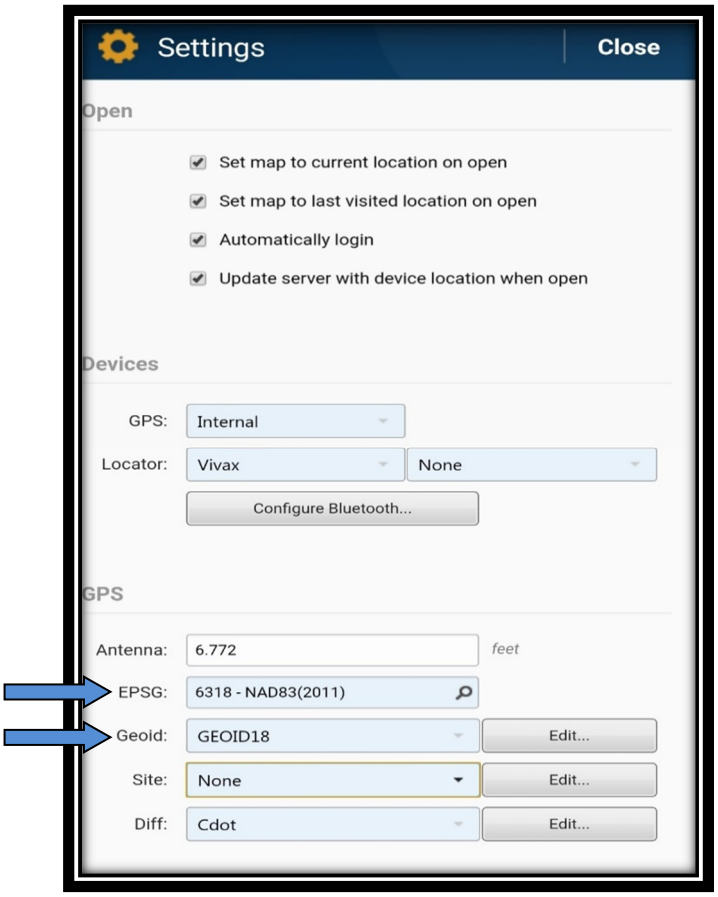
1.3. Projections and Coordinate Systems

Horizontal Datum: The North American Datum of 1983, 2011 Adjustment (NAD 83) and the Geodetic Reference System of 1980, (GRS80), select EPSG 6318 within the PointMan settings menu.

Vertical Datum: The North American Vertical Datum of 1988, (NAVD 88) RTK GPS is an acceptable method to derive NAVD 88 elevations and is the Vertical Datum that is used for all projects performed for CDOT. Select the latest Geoid model from the PointMan mobile application in order to compute orthometric heights (ground corrected elevations). The latest Geoid model that is acceptable is Geoid18 and available within the PointMan settings menu.

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1.4. Positional Accuracy Specification



CDOT requires positional accuracy 1, 2 or 3 for all utilities installed within CDOT ROW. The designated Accuracy Level designation shown in Table1 below. Utilizing CDOT's mobile application pedigree (survey record) will assist in determining the accuracy levels assigned to the specific permitted installation by the utility companies' representative responsible for collection of as-built data.

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Table 1. Positional Accuracy Requirements

Positional Accuracy Level	Positional Accuracy[1] (English Units)	Positional Accuracy[1,2] (SI Units)
1	0.1 feet	25 mm
2	0.2 feet	50 mm
3	0.3 feet	100 mm
4	1 foot	300 mm
5	3 feet	1000 mm
0	Indeterminate	Indeterminate

[1] At the 95% confidence level, using the root-mean-square error (RMSE) in accordance with FGDC-STD-007.3-1998. "Positional Accuracy" is in direct reference to the actual geodetic positional coordinates as referenced to the National Spatial Reference System (NSRS) maintained by the National Oceanic and Atmospheric Administration (NOAA) National Geodetic Survey (NGS). Geodetic positional coordinates (latitude, longitude, and orthometric heights) reference to the official U.S. datums, currently, the North American Datum of 1983 (NAD 83) and the North American Vertical Datum of 1988 (NAVD 88).

Rigid aboveground features are subject to the same positional accuracy requirements as underground features. The positional accuracy of suspended aerial cables and wires is variable due to environmental factors and therefore shall be classified as Level 0, except at the points where they are anchored to support structures such as poles.

For linear features, the depicted position must meet the tolerances as specified in **Table 1** at every position along the length of the feature in order to be designated at the appropriate accuracy level.

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2.0 Utility Type Feature Codes – Table 2

Utility Type	Feature Code	Description of Utilities
Test hole **Photo Test hole**	5950 17	Point - Test hole physically locating X,Y,Z underground facility location.
Proposed running line	6001 or 6075	Line segment code 6001 – Surface elevation of proposed HDD bore. Point - 6075 location bore log depth required for each observed point.
Communication	4210 4410 4211	Line segment - All communication facilities, including fiber optic (4211), copper (4210), coaxial (4410), including appurtenances within defined size parameter
Gas	4510 4511	Line segment – Low pressure (4510) High pressure (4511) Natural gas transmission, distribution, service lines, and appurtenances within defined size parameter.
Electric	4310	Line segment - Secondary electric or higher voltage
Pipe (Oil)	4610 or 4611	Line segment - Pipeline facilities, including crude oil, refined oil, or all other types of oil pipeline transmission, distribution, service lines, and appurtenances within defined size parameter.
Propane	4512	Line segment - Propane transmission, distribution and service lines, and appurtenances within defined size. .parameter
Sanitary Sewer	4811	Line segment - Sanitary sewer facilities including all mains, collection system, forcemains, services and leads, including appurtenances within defined size parameter. (Combined sewer is classified as sanitary sewer).
Surface Elevation	6075	Point – X,Y,Z single observation for surface elevation.

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Utility Type	Feature Code	Description of Utilities
Storm Sewer	2712	Line segment - Storm sewer facilities including all mains and collection system, including appurtenances within defined size parameter. (Excludes underdrain)
Water	4710	Line segment - Water transmission, distribution, service lines, and appurtenances within defined size parameter. (Excludes irrigations systems)
Unknown	6075 or 6001	Point and Line segment - This designation can be used for those facilities not covered by the above feature codes, including but not limited to industrial facilities of all types and discovered utilities where the type of utility is unknown.

2.1 General Observations Standards

1. All transmission, distribution and collector system main lines
   a. Start and end points
   b. Minimum of every 100 feet with the following additional points
      i. Deviations in installation alignment (horizontal and vertical) including but not limited to the following:
         a. Intentional changes in geometry such as changing direction to avoid obstacles
         b. Fittings such as elbows (horizontal and vertical)
      ii. Changes in facility characteristics (e.g. Change in size, material, number or pair, encasement size, material, etc...)
      iii. Start and end point for vaults
2. Appurtenances installed concurrently with new main installations, whereas appurtenances are defined as service leads and stubs.
   a. Tap-in at the main and at (near) the right of way line
3. New appurtenances from existing mains
   a. All size and material types shall be recorded for each utility type
   b. Tap-in at main and at (near) the right of way line

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4. Transverse utility crossings installed via trenchless methods
   a. All qualified utilities crossing roads as described in Section 2.4
   b. 25 foot intervals across pavement sections when safely achievable

2.2 Direct Observations (Figure 2)

In a direct observation, a field technician places the surveying instrument directly on the utility and records the X, Y, Z position. This type of observation is commonly achievable if utilities are installed via open excavation methods, or at bore pits and tie in locations where trenchless technologies are used. Data collection of directly observed utilities yield the highest level of confidence, but requires daily coordination with construction activities so the field surveyor can physically observe the utility at the required locations prior to backfilling.

Figure 2



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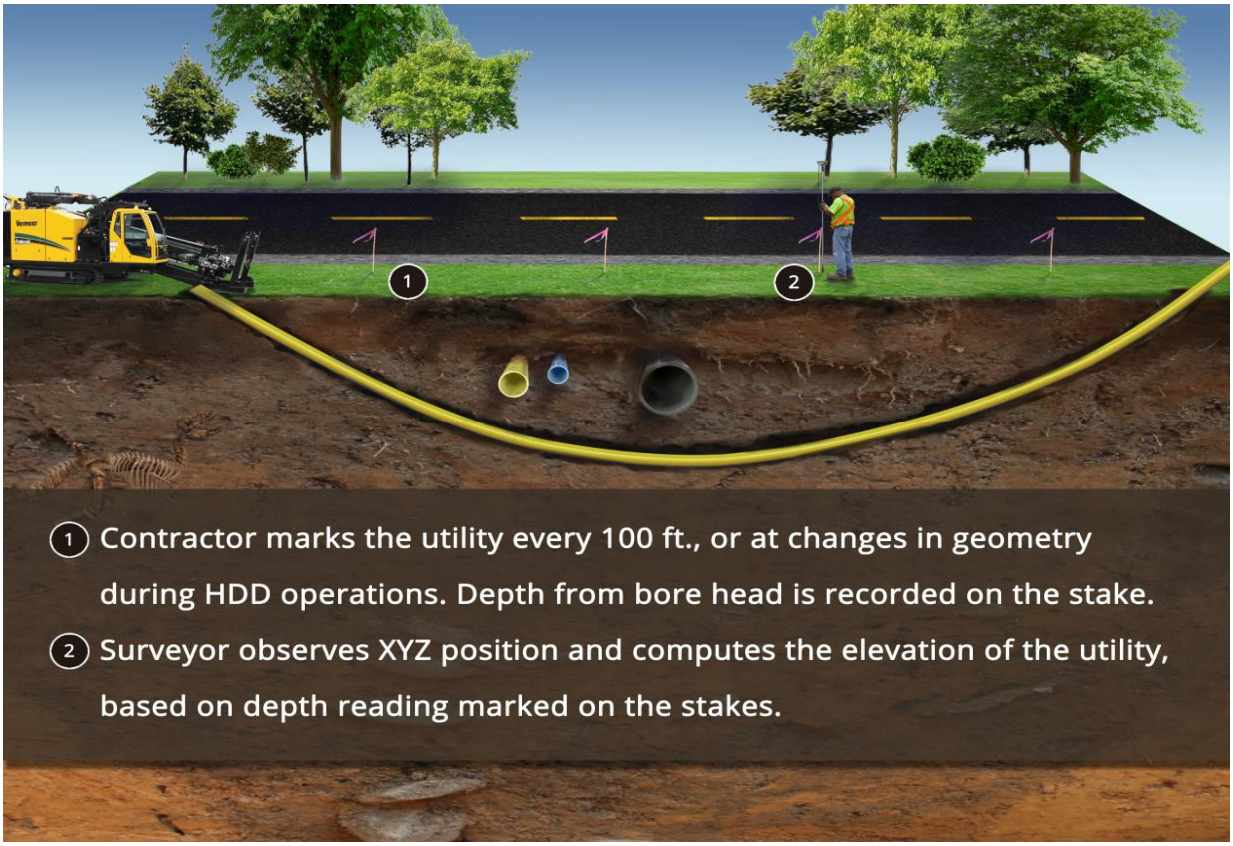
2.3 Indirect Observations (Figure 3)

Common installation methods include various trenchless technologies, which prevent the direct observation of installed utilities. The following are common methods of coordination of data collection aimed at producing high-level data collection results.

Field Witnessing: For trenchless installation methods, observe and survey all tie-in locations, bore pits, or any other areas where the utility is directly exposed. Construction crews must witness the location and depth of the installed utility during mainline trenchless operations. Field witnessing needs to consist of physical marks in the field so that a field surveyor can record a survey observation at the centerline of the utility on the ground, then compute the elevation of the utility by subtracting the field-witnessed depth from the ground elevation. **Figure 3** is an example of field witnessing a trenchless utility installation. A horizontal directional drilled (HDD) fiber optic line is documented with a mark on the centerline of the utility with the ground surface depth recorded within CDOT's mobile application. The reading from the bore head is also required to be documented within CDOT's mobile application (Use **Table 2** for Proposed running line point code that corresponded with the type of utility being observed, for example use 4211 for Fiber Optic to record bore head depth). Utility companies must record a spatial position (X, Y, Z location) at the ground surface, and then compute the elevation of the top of the utility.

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Figure 3

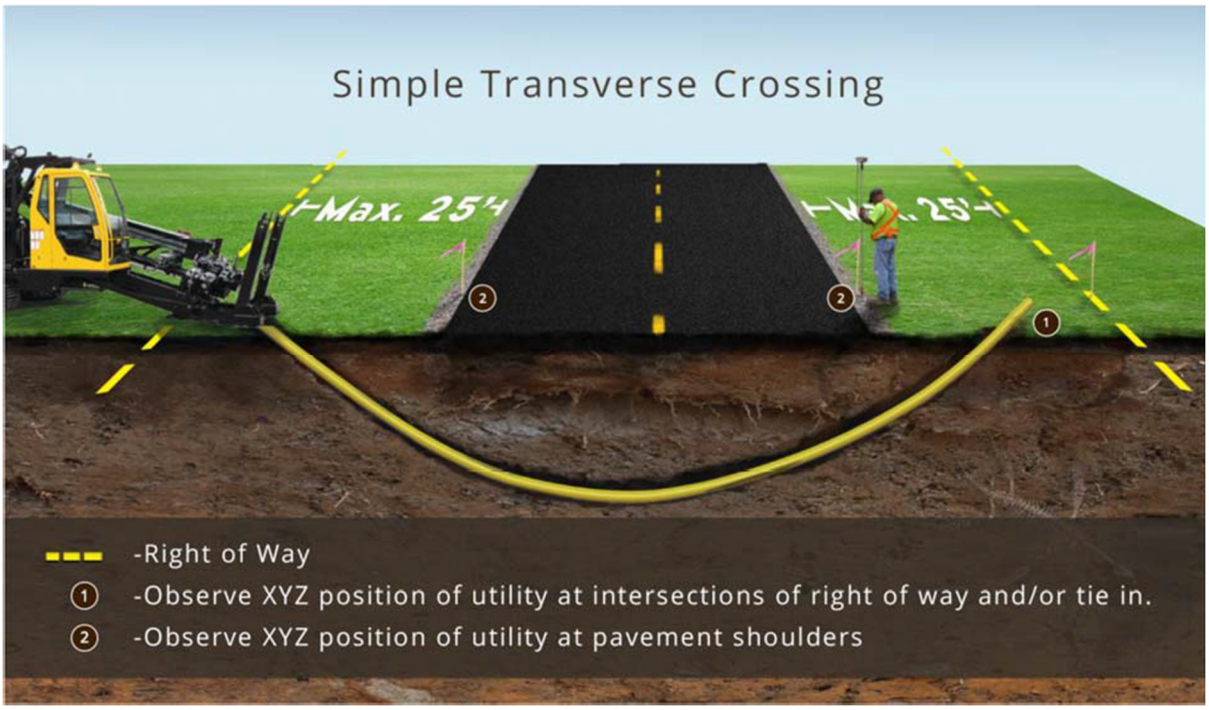


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2.4 Simple Transverse Utility Crossings

Certain transverse utility crossings may require deviation from the standards in order to maintain a safe work environment. If there are no safe methods of field witnessing the boring location and depth within a pavement section, collect a survey observation at or near the edge of pavement before crossing the pavement section. Then continue by collecting a survey observation at or near the opposite edge of pavement and continue per the normal observation procedures previously described, see **Figure 4** below:

Figure 4



2.5 Unique Requirements for Trenchless Installations on Transverse Utility Crossings

All other transverse utility crossings that are installed using methods conducive to a direct survey observation require survey observations to be collected at safe intervals when crossing a pavement section. Additionally, all utilities will be directly observed when installed using a method that support direct observation.

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All utilities installed by trenchless technologies must be observed directly above the installed utility with the elevation computed from the best available depth readings (typically depths read from bore head during installation or tracer wire and EM locating device). The accuracy of the depth readings to the installed utility will vary depending on the type of equipment used during installation.

Direct survey observations are required where utilities are exposed; including tie-in locations, bore pits, hand holes, and manholes. Alignment and depth will be documented during boring operations at the required interval. Some form of field witnessing must be used to mark the horizontal location and depth of the utility based on readings from the equipment being used. Then, the utility company can survey each marked location and compute the elevation of the installed facility based on the recorded depth readings at each surveyed location. At a minimum, alignment and depths must be physically documented at an interval of not more than 100 feet and at all changes in horizontal and vertical alignment.

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Figure 5

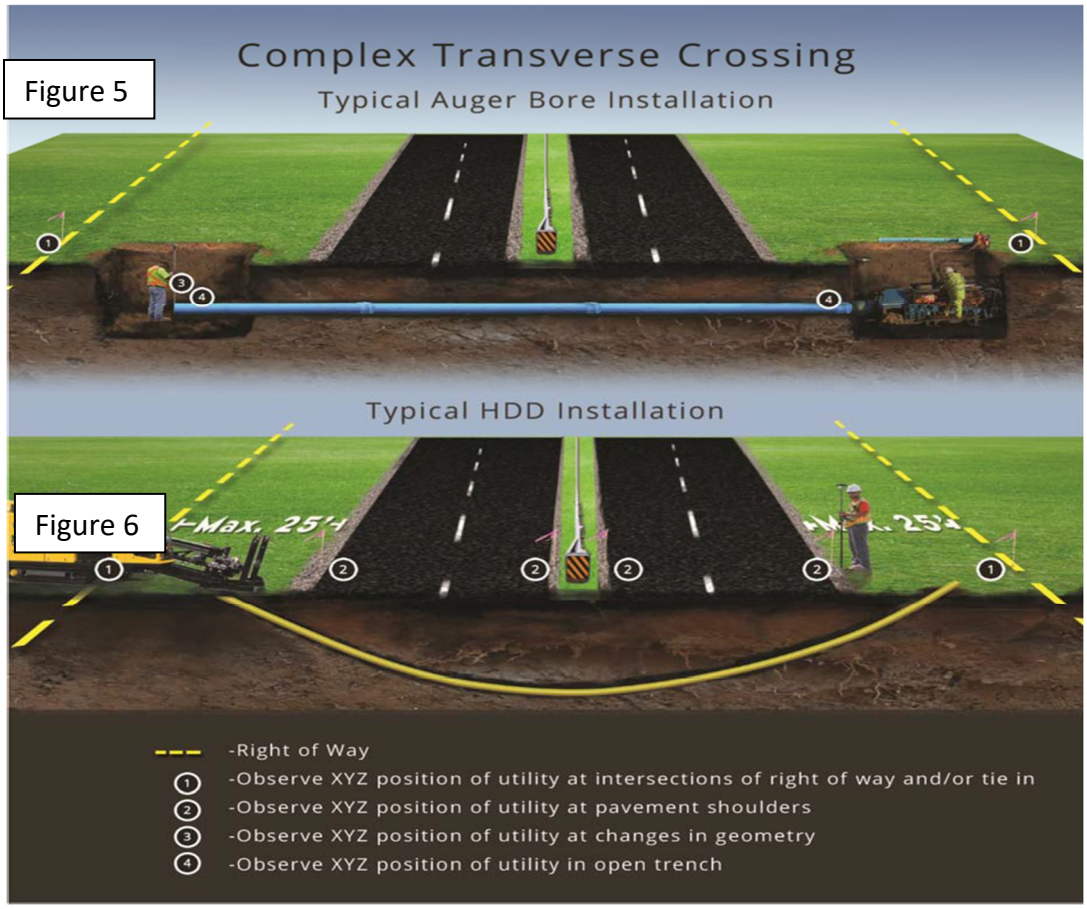


Figure 6

The more survey observations collected along a utility line will increase the accuracy of the true three-dimensional alignment. For example, long and deep bores could create a parabolic curve shaped utility that will not be accurately represented with point spacing at 50 feet. Use professional judgement and collect additional points at a closer interval to generate a more representative geometry of the utility. **Figure 5** depicts a complex transverse crossing and **Figure 6** depicts a Typical HDD Installation.

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3.0 Guidance for Pothole and Existing Utility data collection

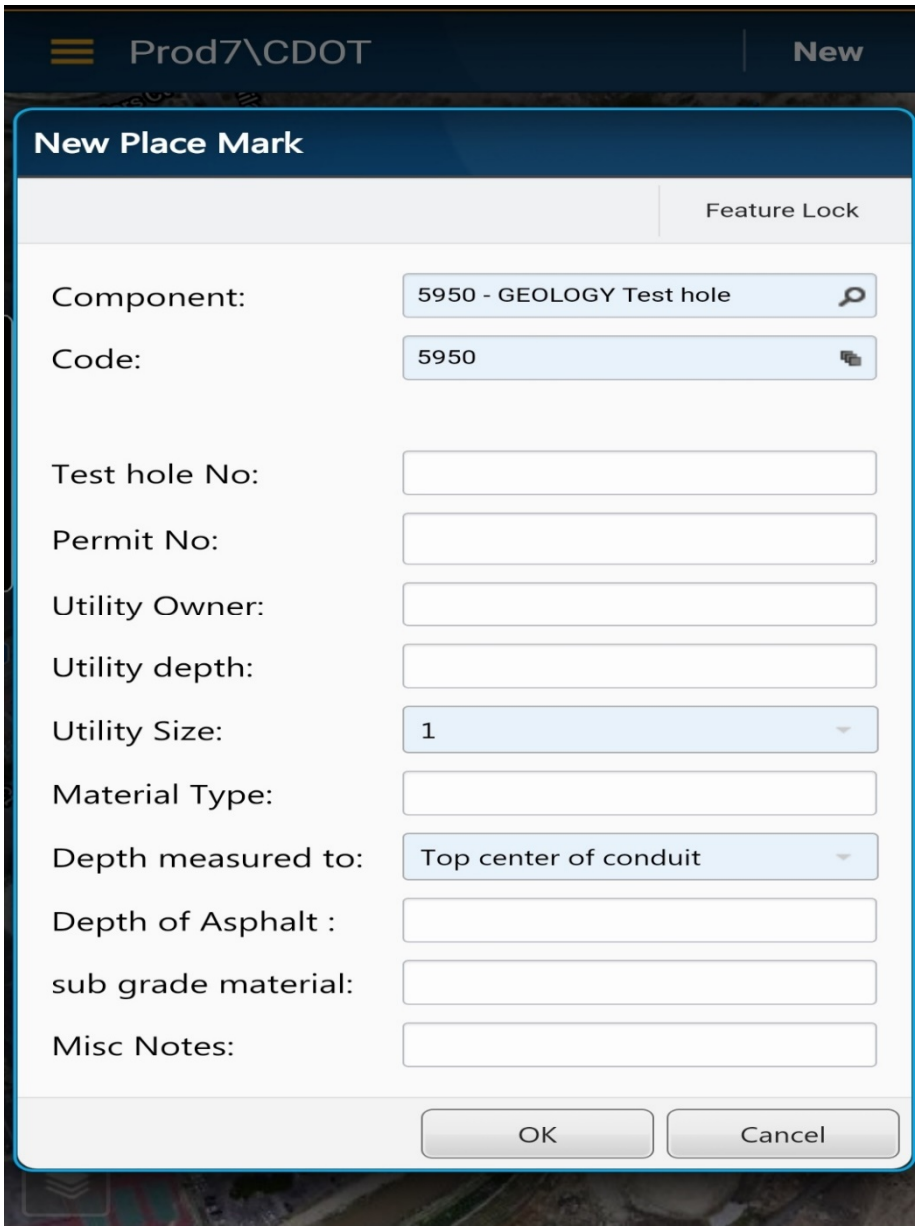
Test hole data either during construction or during pre-construction activities are subject to the following data collection protocols:

All test hole data shall meet the positional accuracy requirements listed in Section 1.4, Positional Accuracy Specification, unless otherwise directed by CDOT. Capture the surface elevation and Meta data for the test hole utilizing the Feature Code 5950 as shown in the screen capture example to the right.
During test hole data collection, it may be advantageous to locate positions identifiable features, such as measuring the depth from existing ground surface or depth of pavement. All such relative positioning measurements shall be reduced to actual absolute coordinate positions by utilizing CDOTs mobile application. All positions shall be based on coordinate standards identified in Section 1.3 (Positions and Coordinate Systems) including Geoid derived elevations. All test hole observations captured under feature code 5950 shall include the following information:

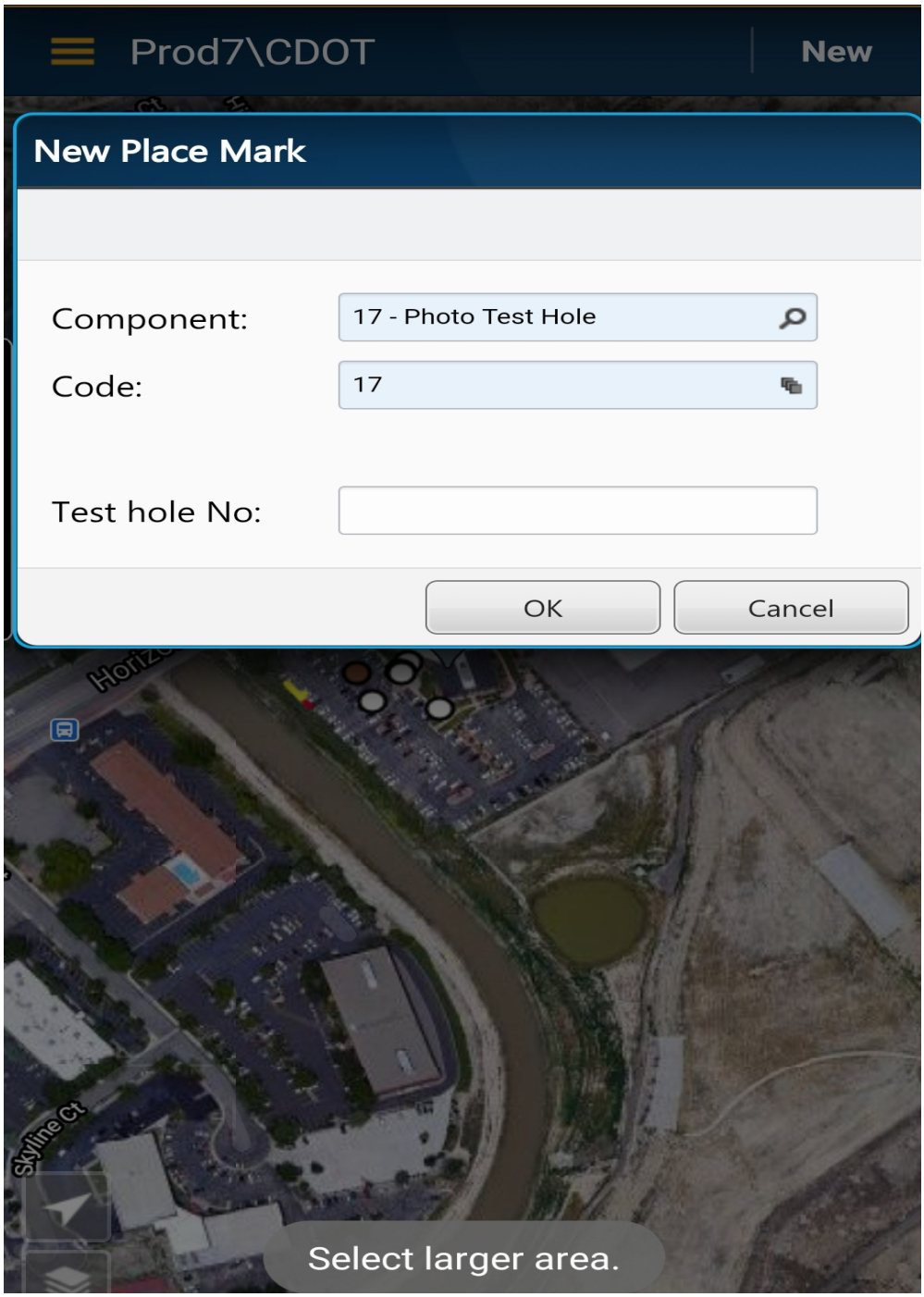
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a) Test hole number
b) Permit Number
c) Utility Owner
d) Utility Depth
e) Size of Utility
f) Material Type
g) Depth measure to
h) Depth of pavement
i) Sub-grade material
j) Miscellaneous notes

1. All test holes are required to be documented with a photo during direct (**Figure 1 below**) and indirect observations (**Figure 2 below**).



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3.1 Direct Observations (Figure 1)

Test hole photo documentation example: Direct observation of the top of conduit.



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3.2 Indirect Observation (Figure 2)

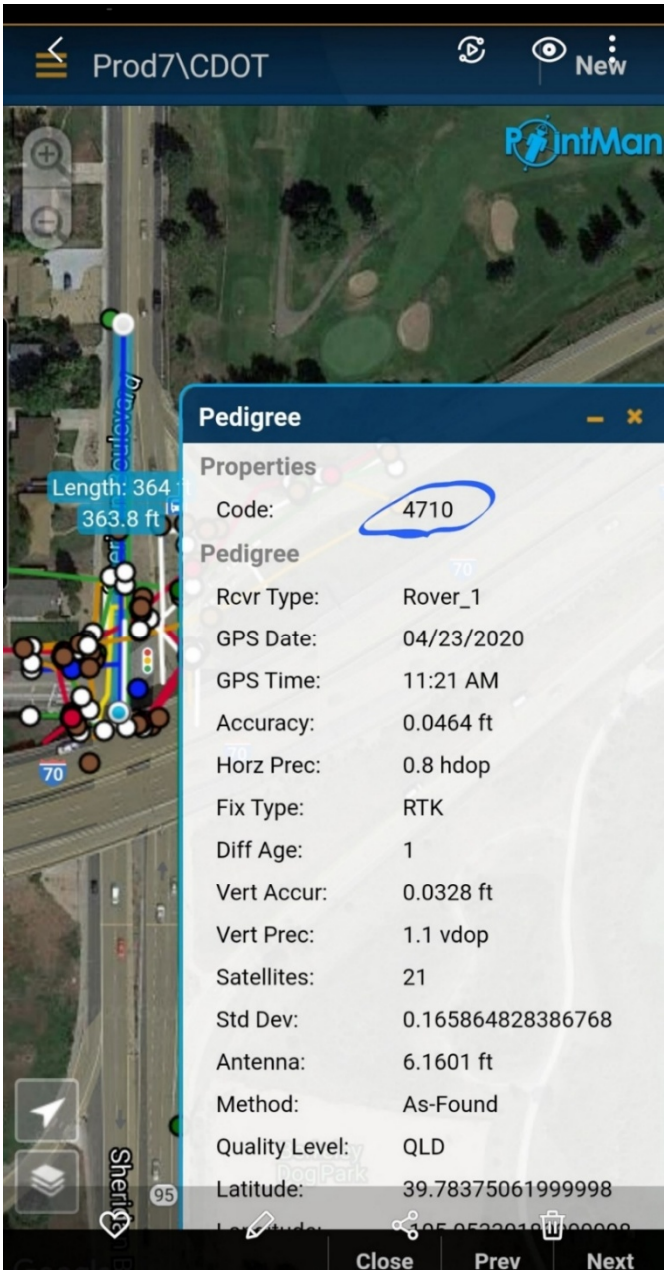
Document test hole observations and include surface makings as shown in the example below:



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3.3 Existing Utility Data collection feature codes

Existing Utility data shall utilize the codes found in Table 2 and shall comply with Sections 1.3 and 1.4. The existing Water Line below is an example utilizing Feature Code 4710:



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Revision of Section 625
Construction Surveying

Method of Measurement

Subsection 625.12 shall include the following:

Construction surveying (point man) will not be measured but will be paid for on a lump sum basis.

Basis of Payment

Subsection 625.13 shall include the following:

Payment will be made under:

Pay Item	Pay Unit
Construction Survey (Pointman)	Lump Sum

1
Revision of Section 626
Public Information Management
(Tier III)

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

Description

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

Anticipated communications issues on this project include:

- Lane Closures
- Sidewalk Trail Detour/Closures
- Construction Phasing
- Traffic Signal Work

Construction Requirements

(a) **Public Information Manager (PIM).** The PIM shall perform all activities associated with Public Information Management for this project. In the event the PIM is not available, the Backup PIM shall perform the required activities. The PIM shall not be the Project Superintendent.

Within ten days of the Notice to Proceed date or five days before the Pre-construction Conference, whichever is later, and at least 14 days before the start of PIM work the Contractor shall submit the name, contact information, and resume of the PIM and the Backup PIM to the Engineer. The PIM and Backup PIM shall have a minimum of five years of professional experience in public or media relations, marketing, or other related field and appropriate verbal and written communication skills. Experience in administrative or business office duties is not a related field.

2
Revision of Section 626
Public Information Management
(Tier III)

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

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

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

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

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

3
Revision of Section 626
Public Information Management
(Tier III)

(5) **Lane Closure Reporting.**

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

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

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

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

4
Revision of Section 626
Public Information Management
(Tier III)

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

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

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

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

5
Revision of Section 626
Public Information Management
(Tier III)

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

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

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

6
Revision of Section 626
Public Information Management
(Tier III)

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

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

(vii) **Project Fliers.** The PIM shall develop project fliers using the CDOT or the City project flier template available in the Project Onboarding/Offboarding Request Form PIM resources. The PIM shall submit the draft project flier to the Engineer for review 10 days before the planned distribution and shall distribute the project flier at least 10 days before the Project's start or milestone. The review and approval of the project flier will not exceed five days.

This project requires project fliers at the following milestones:

1. Initial project flier

The initial project flier shall provide the project start and end dates, project location, description of work, traffic impacts, scheduled work hours and workdays, the Project Hotline telephone number, email address, web address, project map, photo of the project area, and a construction safety message as defined by CDOT. The PIM shall distribute the initial project flier before construction starts.

7
Revision of Section 626
Public Information Management
(Tier III)

Develop the list of recipients via http://uspseverydoordirectmail.com, from county GIS mapping, or other approved method. The PIM shall deliver one approved flier per property owner and each tenant in the immediate vicinity of the project limits. The estimated number of printed fliers is 150. The PIM shall distribute an email containing a digital form of the flier to stakeholders identified in the Stakeholder List.

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

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

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Revision of Section 626
Public Information Management
(Tier III)

Table 626-1 - Response Timing

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

Method of Measurement

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

Basis of Payment

Pay under:

Pay Item	Pay Unit
Public Information Management (Tier III)	Lump Sum

9
Revision of Section 626
Public Information Management
(Tier III)

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

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

1
Revision of Section 627 and 713
Preformed Thermoplastic Pavement Marking

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

Construction Requirements

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

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

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

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

(c) **Inlaid (Word-Symbol) (X-walk/Stop-bar)**

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

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

2
Revision of Section 627 and 713
Preformed Thermoplastic Pavement Marking

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

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

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

    a. The markings shall be a resilient white, yellow, or other color thermoplastic product, the surface of which shall contain glass beads and abrasives in an alternating pattern. The markings shall be resistant to the detrimental effects of motor fuels, lubricants, hydraulic fluids, etc. Lines, legends, and symbols shall be capable of being affixed to bituminous or Portland cement concrete pavements by the use of the normal heat of a propane torch.

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

3
Revision of Section 627 and 713
Preformed Thermoplastic Pavement Marking

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

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

3. Material: The marking material shall be composed of an ester modified rosin resistant to degradation by motor fuels, lubricants, etc. in conjunction with aggregates, pigments, binders, abrasives, and glass beads which have been factory produced as a finished product. The marking material shall meet the requirements of the current edition of the Manual on Uniform Traffic Control Devices for Streets and Highways. The thermoplastic material shall conform to American Association of State Highway and Transportation Officials (AASHTO) designation M249, with the exception of the relevant differences due to the material being supplied in a preformed state.

A. Graded Glass Beads

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

4
Revision of Section 627 and 713
Preformed Thermoplastic Pavement Marking

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

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

B. Pigments

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

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

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

5
Revision of Section 627 and 713
Preformed Thermoplastic Pavement Marking

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

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

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

F. Retro reflectivity: The material, when applied in accordance with manufacturer's guidelines, shall demonstrate a uniform level of sufficient nighttime retroreflection when tested in accordance to ASTM E1710. The applied material shall have an initial minimum intensity reading of 275 millicandelas per square meter per lux (mcd·m-2·lx-1) for white, as measured with a pavement marking retroreflectometer.

G. Environmental Resistance: The material shall be resistant to deterioration due to exposure to sunlight, water, salt, or adverse weather conditions and impervious to oil and gasoline.

Only Preformed Thermoplastic Pavement Marking material listed on the Department's approved products list may be used.

6
Revision of Section 627 and 713
Preformed Thermoplastic Pavement Marking

Basis of Payment

Subsection 627.13 shall include the following:

Pay Item	Pay Unit
Preformed Thermoplastic Pavement Marking (Xwalk-Stop Line) (SPECIAL)	Square Feet

1
Revision of Section 630
Uniformed Traffic Control

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

Description

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

The Contractor shall contact the following for coordination:

Mesa County Sheriff's Office
970-244-3500

Materials

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

Method of Measurement

Uniformed Traffic Control will be measured as the contract unit price per hour for the uniformed traffic control officer and traffic control vehicle.

Basis of Payment

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

Payment will be made under:

Pay Item	Pay Unit
Uniformed Traffic Control	Hour

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

1
Revision of Section 630
Pedestrian Barricade (ADA)

Revise Section 630 of the Standard Specifications for this project as follows:

Description

Subsection 630.01 shall include the following:

This work consists of the construction of temporary pedestrian barricades at locations as shown on the plans and per CDOT Standards S-630-1 and S-630-2. Pedestrian Barricades (ADA) shall be fully compliant with ADA and current PROWAG guidelines.

Materials

Subsection 630.02 shall include the following:

Pedestrian railing/barrier shall be used when the pedestrian detour is within 5 feet of the edge of traveled way, unless there is a curb, or when noted in the Plans. Pedestrian railing/barrier is required in all applications where the exact path may be unclear to the pedestrian.

The pedestrian barricade shall conform to MUTCD 6K.10 for pedestrian traffic control. The barricade shall be made of High Density Polyethylene (HDPE) with Ultraviolet (UV) stabilizers, or other approved material. It shall be able to interlock with adjacent barricades of the same product such that it forms a wall or a rail.

The pedestrian barricade shall comply with the crash test requirements contained in MASH Level TL3.

The pedestrian barricade shall have a continuous detectable bottom and top surface to be detectable to users of long canes. The bottom of barricade shall be no more than 2 inches above the ground. The top of barricade shall be no lower than 32 inches above the ground. The gap to the bottom of the barricade may be used for drainage. The barricade shall be reflectorized in accordance with MUTCD requirements. No extended bases or protrusions shall extend into the walkway.

2
Revision of Section 630
Pedestrian Barricade (ADA)

The Contractor shall submit manufacturer's documentation confirming that the barricade meets all applicable ADA requirements for barricades or rail.

Construction Requirements

Subsection 630.13 shall include the following:

Pedestrian Barricade (ADA) shall be securely fastened in place and approved by the Engineer prior to detouring pedestrian and bicycle traffic into locations with Pedestrian Barrier. Barriers shall be ADA-compliant.

Construction of the Pedestrian Barricade (ADA) shall be in accordance with manufacturer recommendations.

The ADA pedestrian barricade may be moved to other locations as shown on the plans or as directed upon completion of use at one location.

Method of Measurement

In subsection 630.17, delete the third paragraph and replace with the following:
Traffic channelizing devices consisting of vertical panels, traffic cones, or drum channelizing devices will be measured by the unit. Concrete barriers will be measured by the linear foot. Barricades will be measured by the number used, except Pedestrian Barricade (ADA). Barricade warning lights shall be furnished as a part of this item when required by the Traffic Control Plan (TCP). Advance Warning Flashing or Sequencing Arrow Panels will be measured by the unit according to size.

Pedestrian Barricade (ADA) will be measured as the actual linear feet of barricade installed and accepted.

3
Revision of Section 630
Pedestrian Barricade (ADA)

Basis of Payment

Subsection 630.18 shall include the following:

Payment will be made under:

Pay Item	Pay Unit
Pedestrian Barricade (ADA)	Linear Foot

1
Revision of Section 630
Portable Variable Message Sign

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

Subsection 630.01 shall include the following:

This work includes furnishing, operating, and maintaining a Portable Message Sign Panel.

Add subsection 630.031 immediately following subsection 630.03 as follows:

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

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

Each sign shall also conform to the following:

(1) In addition to the onboard solar power operation with battery back-up, each sign shall be capable of operating on a hard wire, 100-110 VAC, external power source.
(2) All electrical wiring, including connectors and switch controls necessary to enable all required sign functions shall be provided with each sign.
(3) Each sign shall be furnished with an operating and parts manual, wiring diagrams, and trouble-shooting guide.
(4) The Portable Message Sign shall be capable of maintaining all required operations under Colorado mountain-winter weather conditions.
Each sign shall be furnished with an attached license plate and mounting bracket.

2
Revision of Section 630
Portable Variable Message Sign

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

Subsection 630.13 shall include the following:

The Portable Message Sign Panel shall be on the project at least 7 calendar days prior to the start of active roadway and water line construction. Maintenance, storage, operation, relocation to different sites during the project, and all repairs of Portable Message Sign Panels shall be the responsibility of the Contractor.

Operation, relocation to different sites, storage, maintenance and all repairs of portable message signs, including theft or vandalism, shall be the responsibility of the Contractor at no additional cost to the project.
Portable Message Sign Failure:

The Contractor shall repair or replace a non-operational sign immediately. If any element of the equipment named in the specification is unable to perform its intended function as described herein in any way, the sign shall be considered non-operational.

Subsection 630.17 shall include the following:

Portable message sign panels will be measured by calendar days for each sign panel that is being utilized, which will be the total number of days for all portable message sign panels on the project. To be considered for payment, the number of Portable Message Sign Panels and the number of days each Portable Message Sign Panel is used must be approved by the Project Engineer in advance. It is anticipated that three (3) Portable Message Sign Panels will be used periodically on this project. Portable Message Sign Panels used to convey notices or advisories to drivers shall be in place and operational seven (7) **calendar days** prior to the occurrence of the event. Portable Message Sign Panels used without prior approval of the Project Engineer will not be measured and not paid for separately. Portable Message Sign Panels that are being stored onsite and not being utilized will not be measured, and not paid for separately.

3
Revision of Section 630
Portable Variable Message Sign

Subsection 630.18 shall include the following:

Pay Item	Pay Unit
Portable Message Sign Panel	Each

Payment shall be full compensation for all work and materials required for use of the portable message signs on the project. The “air-time” and “base rate” charges from the telephone company will not be measured and paid for separately but shall be included in the work. All costs incurred by the Contractor while moving or relocating the signs for any reason will not be measured and paid for separately but shall be included in the work.

1
Revision of Section 630
Mobile Attenuator

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

Subsection 630.01 shall include the following:

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

Subsection 630.09 shall include the following:

Mobile Attenuator Options:

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

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

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

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

2
Revision of Section 630
Mobile Attenuator

Subsection 630.13 shall include the following:

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

Subsection 630.17 shall include the following:

Mobile Attenuators will be measured by the maximum number of approved units in use on the project at any one time.

Subsection 630.18 shall include the following:

Pay Item	Pay Unit
Mobile Attenuator	Each

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

1
Revision of Section 632
Night Work Lighting

Section 632 is hereby added to the Standard Specifications for this project as follows:

Description

632.01 This work consists of furnishing, installing, operating, maintaining, moving, adjusting, and removing lighting to illuminate construction work spaces for night work. Night work will be defined as work performed between 30 minutes before sunset and 30 minutes after sunrise.

Materials and Equipment

632.02 The Contractor shall provide lighting for night work in the activity area work space where construction equipment, workers on foot, or both are present. The work space is that portion of the roadway closed to road users, or outside of the roadway, set aside for workers, equipment and materials performing contract work. The work space may be stationary or may move as the work progresses.

Illumination may be accomplished by using a combination of portable lights, floodlights, equipment mounted lights, or other lighting methods that will provide the required minimum lighting intensity. Light fixtures that are mounted on the construction equipment shall have a secure connection to minimize vibration and ensure that the view of the equipment operator is not obstructed. Portable lights shall be aimed either generally parallel or perpendicular to the roadway, aimed downward towards the work to avoid glare to oncoming drivers. Existing street and highway lighting shall not eliminate the need for the Contractor to provide work area lighting. Vehicle headlights shall not be permitted as the sole means of illumination while working.

632.03 Portable Generator and Inverter Generator. The Contractor shall provide a portable generator, inverter generator, or both as needed to power the added equipment mounted lights on motorized equipment if the existing power supply on the equipment is insufficient to power the added lights. Fuel tank capacity and availability of fuel on site shall be sufficient to permit uninterrupted operation throughout the planned shift. All power sources shall be equipped with a ground-fault circuit interrupter. The generator shall be placed or temporarily mounted on the equipment without obstructing access onto the equipment or the view of the operator.

2
Revision of Section 632
Night Work Lighting

632.04 Light Meter. The Contractor shall furnish a light meter for use by the Engineer. The meter shall have a digital display calibrated to NIST standards, shall be cosine and color corrected with an accuracy of +/- 5 percent. The light meter shall remain the property of the Contractor after final acceptance.

Construction Requirements

632.05 Lighting for night work shall include:

(1) Minimum lighting intensity of 5 foot candles for work space illumination.

(2) Illuminate the stationary work space as stated in (1) above where construction equipment, workers on foot or both are present.

(3) Light sources shall be positioned not to interfere with or impede traffic in any direction and not cause glare for motorists or onto adjacent properties whenever possible. The Contractor shall make adjustments, use visors or shields, or both to minimize glare.

(4) Illumination for mobile operations within a closed travel lane with traffic control devices will be defined as 20 feet in front of and behind and 5 feet to each side of each piece of moving equipment.

(5) The Contractor shall provide portable lights for Engineer's and contractor personnel performing materials testing for either mobile or stationary operations to illuminate the testing work space as stated in (1) above. For concrete operations at night, the Contractor shall illuminate the designated concrete truck washout location including the access and the wash out site.

(6) Workers on foot, performing work within a moving work space (i.e. striping layout/installation, surveying, etc.) shall wear ANSI approved high visibility apparel and headwear for Class 3 risk exposure including vest, Class E pants or leg gaiters, and reflective tape on hard hats. Workers may use portable lighting that can be worn on the hard hats that provide 360 degree visibility.

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Night Work Lighting

(7) Portable light towers and lights mounted on stands shall be sturdy and free-standing without the aid of guy wires or bracing. Minimum illumination levels as stated in (1) above shall be maintained at a distance of 5 feet on all sides of stationary equipment with either equipment mounted or free standing lights.

(8) The Contractor shall ensure that all pieces of equipment have operating lights to illuminate operator's controls, backhoe and loader buckets, and illuminate the equipment reach limits around rotating equipment (i.e. the paving machine shall have illumination for the hopper, auger, and screed areas).

(9) The TCS vehicle shall have the rear of the truck illuminated while installing, maintaining, and removing traffic control devices unless sufficient lighting levels exist with stationary lights.

(10) The Contractor shall maintain a uniformity ratio no greater than 5:1 over the stationary work space. Uniformity ratio is the ratio of average to minimum horizontal illuminance within the work space. The uniformity ratio shall be determined by dividing the average of all light meter measurements by the light meter measurement at the darkest spot within the illuminated area.

632.06 Night Work Lighting Plan. The Contractor shall submit a lighting plan to the Engineer for review signed by the Contractor's designated person three days in advance of the Preconstruction Conference. The lighting plan shall appropriately describe the work and include the following:

(1) Layout drawing and supplemental narrative showing light locations, equipment mounted lights, and configuration including both typical spacing and lateral placement for each work activity.

(2) Tabulation of lights for those lights that are included within the Night Work Lighting pay item. Lights included in the tabulation such as tower lights, lights mounted on stands and lighting mounted to mobile equipment (not original equipment lights) but those additional equipment mounted lights or portable lights that provide the 20 feet in front and behind illumination zone shall have catalog cuts giving the specific brand names, model numbers, lamp type and wattage.

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Night Work Lighting

(3) Narrative description of those operations where workers will be on foot in a moving work space.

(4) Details of hoods, visors, louvers, shields or other means to be used to minimize glare.

The plan shall be revised and updated by the Contractor as requested by the Engineer during the progress of the work to accommodate changes to the work.

632.07 Inspection of Lighting. Lighting inspection by the Engineer will be performed jointly with the Contractor's designated person on a drive through the project to include (1) observation of the lighting setup to evaluate glare potential for drivers and workers and (2) light meter measurements to determine minimum illumination levels. The Contractor shall make adjustments to the lighting as needed based on the Engineer's inspection. In the event of any failure of the lighting system, the Engineer may determine to discontinue work until the required level of illumination is restored. Delays due to insufficient lighting levels are the responsibility of the Contractor. Any corrections and deficiencies needed to provide the minimum illumination levels shall be addressed by the start of the next work shift.

The Engineer will take light meter measurements to verify the minimum lighting levels using a light meter provided by the Contractor during the night work shift. Light meter readings will be taken within the work space where work is being performed, in a horizontal plane, light sensor part of the meter held parallel to the ground with the sensor aimed upward, 3 feet above the pavement or ground surface. Meter readings will be taken at the source at 5 foot intervals out to the illuminated work space perimeter. These measurements will be documented and filed in the project records.

632.08 Lighting for Flagger Stations. For nighttime flagging, flagger stations shall be illuminated by an overhead light source providing a minimum lighting intensity level of 5 foot candles measured 1 foot out from the flagger's chest. The flagger station light shall illuminate the station area with a radius of at least the width of the lane plus 5 feet, and be centered on the flagger in the initial flagging position. The size of the illuminated area shall be increased to account for flagger movements required to control traffic. The flagger station lighting shall be maintained at an adequate height above the pavement and be capable of being shielded through the use of visors, hoods, louvers, or screens as needed to minimize glare to approaching traffic and spilling over onto adjacent properties.

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Revision of Section 632
Night Work Lighting

Method of Measurement

632.09 Lighting for night work will not be measured but will be paid for as a single lump sum.

Basis of Payment

632.10 Payment for lighting as shown on the Night Work Lighting Plan will include all labor, materials, and equipment necessary to complete and maintain the work. Payment for lighting will include portable 360° visibility lighting worn on hard hats.

Progress payments will be made based on the lump sum price bid as follows: 20 percent when the Lighting for Night Work Plan has been submitted, accepted, and satisfactory lighting of nighttime operations has begun; the remaining 80 percent will be paid in equal monthly progress payments for the remaining time lighting is required for the night work operations.

Payment will be made under:

Pay Item	Pay Unit
Night Work Lighting	Lump Sum

Flagger station lighting, designated person, light meters, and additional power sources (generator and inverter) will not be measured and paid for separately but shall be included in the work.

1
Revision of Section 715
Electrical Conduit

Section 715 is hereby added to the Standard Specifications for this project as follows:

715.07 Conduit. Shall include the following:

Unless otherwise specified, conduit shall be rigid metallic or semirigid plastic electrical conduit. Metallic conduit shall be clean, free of burrs, and galvanized.

Plastic conduit shall be a semirigid type currently recommended and UL listed for the proposed use. Underground power conduit shall be RNC: NEMA TC 2, Type EPC-80-PVC, UL 651 with matching fittings by same manufacturer as the conduit, complying with NEMA TC 3 and UL 514B. Underground plastic conduit for ITS devices shall conform to ASTM-F441 schedule 80. Fittings shall be the type used outside the conduit with solvent cement welded. Fittings shall connect the conduit in a manner that makes the joints watertight.

Bored conduit shall be HDPE duct: type EPEC-80 HDPE, complying with NEMA TC 7 and UL 651A Listed and labeled as defined in NFPA 70, by a nationally recognized testing laboratory, and marked for intended location and application.

Underground-Line Warning Tape: Comply with requirements for underground-line warning tape specified as follows:

a. Recommended by manufacturer for the method of installation and suitable to identify and locate underground electrical and communications utility lines.
b. Printing on tape shall be permanent and shall not be damaged by burial operations.
c. Tape material and ink shall be chemically inert and not subject to degradation when exposed to acids, alkalis, and other destructive substances commonly found in soils.

Color and Printing:

a. Comply with ANSI Z535.1, ANSI Z535.2, ANSI Z535.3, ANSI Z535.4, and ANSI Z535.5.
b. Inscriptions for Red-Colored Tapes: "ELECTRIC LINE, HIGH VOLTAGE".
c. Inscriptions for Orange-Colored Tapes: "TELEPHONE CABLE, CATV CABLE, COMMUNICATIONS CABLE, OPTICAL FIBER CABLE".

1
Revision of Section 715
Electrical Pull Box

Section 715 is hereby added to the Standard Specifications for this project as follows:

715.07 Conduit. Shall include the following:

Type Two Pull Box – Shall include but not limited to the following:

1. Basis of design – Flush in-grade and cast in concrete Pull Boxes shall be polymer concrete, bottomless, stackable and tier 22 rated, bolted covers. 13 inches by 24 inches and 18 inches deep manufactured by Quazite; Cat. # PG1324BA18, (or NewBasis Cat. #PCA132418-20018 or Oldcastle Precast Group Cat. #1324-18), Covers shall be Cat. # PG1324HH00 (or NewBasis Cat.#PCA132418-20018 or Oldcastle Precast Group Cat. #1324-T22) stainless steel bolts and the word "GJ" molded into the top.
2. Heavy-Duty, 13 inches wide by 24 inches long by 18 inches deep, Polymer concrete bottomless, TIER 22 rated pull/splice box with straight sides and stackable.
3. Heavy-Duty, non-deliberate traffic rated, TIER 22 rated, 2-bolt cover with engraved legend "CDOT ELEC".
4. Pea Gravel Base – Provide a minimum of 12 inch deep pea gravel base under box for drainage.
5. Pull boxes shall be verified by a 3rd Party Nationally Recognized Independent Testing Laboratory as meeting all test provisions of American National Standards Institute/Society of Cable Telecommunications Engineers (ANSI/SCTE) 77, 2013 Specification for Underground Enclosure Integrity, Tier 22 rating. Pull boxes shall be Underwriters Laboratories (UL) listed. Certification documents shall be submitted with material submittals.
6. Each pull box shall have an Electrical Marker System (EMS) locator disk manufactured into the lid for communication line locating. The locator disk shall be compatible with a CDOT cable locator utilize the APWA uniform color code standard for visual reference if disk is observable on the exterior of the lid. The locator disk shall utilize the proper location frequency for the pull box type.
7. Pull box removable lids shall be provided with a skid-resistant surface and have the words "GJ", "EMS MARKER EMBEDDED IN COVER" and the tier level rating cast into the surface. Pull boxes containing electrical conductors shall have the words "GJ", "EMS MARKER EMBEDDED IN COVER" and the tier level rating cast into the surface. Painting of words shall not be accepted. The cover shall be attached to the pull box body by means of 3/8 inch x 7 inch lag thread hex head stainless steel bolts.

2
Revision of Section 715
Electrical Pull Box

8. One-piece lids shall have a minimum of two lift slots per lid, while split lids shall have a minimum of one lift slot per lid. Test point locations shall be integrated into the pull box lids to provide for attachment of test leads of various connector types for underground conduit tracing. The minimum number of test point locations shall equal the number of conduit banks entering the pull box, up to a maximum of five test points. Pull boxes with split lids shall have the test points on one split lid section only. Pull box lids shall be furnished with 3/8 inch x 1/16 inch deep recesses at locations adjoining each test point for the application of direction arrow symbols indicating the direction of underground conduit exiting the pull box. Recesses shall be thoroughly cleaned with alcohol prior to applying arrow symbols.
9. Wire mesh shall be installed in a manner to completely surround the box as shown on the Plans. The wire mesh shall meet the material standard ANSI/American Society of Testing and Materials (ANSI/ASTM) A555-79 and made of T-304 stainless steel, 0.025 inch wire diameter minimum and shall have a spacing of 4 mesh per inch.
10. A 3/4 inch by 10-foot-long copper coated steel ground rod is required at each new Pull Box location shown on plans.
11. Boxes shall have a concrete ring/collar around all pull/splice boxes installed in open landscape, 4 inch deep x 12 inch wide on all sides as indicated in the S-613-1.

1
Revision of Section 715
Meter Power Pedestal – Cold Sequence

Section 715 is hereby added to the Standard Specifications for this project as follows:

715.09 Secondary Service Pedestals, Lighting Control Centers, and Meter Power Pedestal. Shall include the following:

New Meter Power Pedestal – Provide a NEMA 3R, commercial meter power pedestal all-in-one and shall include but not limited to the following:

1. 120/240V-1ph-3w, Metered, Service Entrance Rated, Meter Power Pedestal with Main Circuit Breaker size as indicated on the panel schedules and one-line diagrams.
2. Stainless Steel, NEMA 3R enclosure.
3. Meter Sockets (200 amp minimum) with lever bypass to Xcel Energy specifications.
4. Meter Pull-Out, Fusible Disconnect with Fuses ahead of meter (cold sequence) to Xcel Energy specifications.
5. Meter cover hold open lever to Xcel Energy specifications.
6. Meter tab lockable dead-front cover to Xcel Energy specifications.
7. Copper bus, service entrance rated, load center panel, with main circuit breaker and all branch breakers as indicated on the panel schedule on the plans. Panel shall be braced at the AIC rating as indicated on the one-line diagram and/or panel schedule whichever is higher.
8. Built-in NEMA 5-20R, GFCI duplex, maintenance receptacle flush in dead front.
9. Provide a 4000 PSI Concrete pad foundation. This shall be bid as pay item 613-40000 Concrete Foundation Pad. Contractor shall provide a structural engineered stamped foundation plan from an engineer registered in the state of Colorado.
10. 3/4” x 10’-0” copper-clad driven ground rods, exothermic weld or underground rated lug connect ground conductor to ground rods. (2) ground rods required.
11. Provide all service lateral and secondary feeder connections as shown on the plans and details.
12. Provide white phenolic label with black letter stainless steel screw attached to enclosure. Label to include “panel designation, voltage, amperage, and fed from” information in a minimum of 1/8” high lettering.

“Arc-Flash Hazard Warning” labels shall be furnished and installed by the electrical contractor per the National Electric Code NEC 110.16 and the NFPA 70E, and all other labels required by NFPA 70 shall be installed on all new panels.

2
Revision of Section 715
Meter Power Pedestal – Cold Sequence

Basis of design: Milbank Slimline CP3A series or equal by one of the following:

1. Myers
2. Eaton/B-Line
3. Strongbox
4. Pacific Electric Inc.

1
Revision of Section 715
Lighting

Section 613 is hereby added to the Standard Specials for this project as follows:

715.02 Concrete Foundation Pads and Light Standard Foundations. Shall include the following:

Light Standard Foundation - The contractor shall provide an engineered stamped drawing for the pre-cast concrete foundation for the specified "lP" Type luminaire and light standard with all requirements shown on details and complying with all requirements of the pole manufacturer's anchor bolt size and bolt circle dimensions with (2) 2 inch conduits (1) in and (1) out of the foundation for power wiring and (1) ½" conduit for ground rod wiring. Provide steel re-enforced, Class B, (Minimum 4,500 psi) concrete and with a design wind speed of 120 MPH minimum.

715.02 Luminaires, Light Sources, and Lamps. Shall include the following:

The Luminaire Type "LP" [Pay Item: 613-13006 Luminaire (LED) (6,000 LUMENS)] shall be Sternberg Part #1A-1527LED-R-12L-35-T2-MDL018-SV1-R7-SC-EZ-BKT. Other specifications include: 120-277VAC, Type II distribution, B0-U3-G2 rating, IP65 rated, U0 uplight rating, 0-10V dimming, UL 1598, CCT is 3500k, Actual lumens: 6,474 as supplied by:

The MH Companies
1044 Speer Boulevard
Denver, CO 80204
Contact: Katie Johnson
Phone: (303) 573-0222
Fax: (303) 573-0922
Email: katie@mhlighting.com

1
Traffic Control Plan - General

The Contractor shall submit a Traffic Control Plan (TCP) for approval by the Engineer prior to the beginning of any construction.

At least two weeks prior to starting construction, the Contractor shall notify the City and Mesa County of the date the Contractor intends to start construction.

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

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

1. Subsection 104.04 and Section 630 of the CDOT Specifications.
2. CDOT Standard Plan S-630-1, Traffic Controls for Highway Construction and CDOT Standard Plan S-630-2. Reference cases 18, 19, 24 and 38.
3. Tabulation of Construction Traffic Control Devices.

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

The City may have entered into operating agreements with one or more law enforcement organizations for cooperative activities. Under such agreements, at the sole discretion of the City, law enforcement personnel may enter the work zone for enforcement purposes and may participate in the Contractor’s traffic control activities. The responsibility under the Contract for all traffic control resides with the Contractor and any such participation by law enforcement personnel in Contractor traffic control activities will be referenced in the Special Provisions. Nothing in this Contract is intended to create an entitlement, on the part of the Contractor, to the services or participation of the law enforcement organization.

2
Traffic Control Plan - General

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

1. A maximum of two work zones are permitted at any one time.
2. During the construction of this project, traffic shall use the present traveled roadway unless identified on the plans or approved by the Engineer.
3. A 10’ minimum width shall be provided for the inner lane during non-working hours. When there is a single lane provided, the minimum lane width shall be 11’ unless otherwise approved by the engineer.
4. Unless shown otherwise, minimum redirect taper rates shall be 10:1 and bay taper rates shall be 5:1.
5. The Contractor shall not have construction equipment or materials in the lanes open to traffic at any time, unless approved by the Engineer.
6. During the resurfacing work, only one lane may be closed to traffic at any time unless approved by the Engineer.
7. The Contractor shall provide for emergency vehicle access into and through the project site.
8. The Contractor shall provide a flagger for equipment, trucks, or other pertinent construction equipment entering or leaving the construction area into traffic.
9. The Contractor shall bear responsibility and expense for maintaining adequate drainage and safe driving conditions at all times. This work shall not be paid for separately but shall be included in the cost of related work.
10. Existing signs in conflict with the temporary lanes shall be covered or reset as conditions require for each construction phase and as directed by the Engineer. Masking of existing signs, including the covering materials and fastening devices, will not be measured and paid for separately but shall be included in the cost of the work.

The contract TCP components are not all-inclusive. The Contractor shall submit a detailed TCP for construction to the Engineer for approval prior to the implementation. The Contractor shall submit the detailed TCP at least 3 weeks before start of work for review and approval. The TCP shall meet the requirements of the plans and specifications.

3
Traffic Control Plan - General

In addition to the items required for MHTs in Section 630 as revised, each TCP submittal shall:

1. Address any required oversize load restrictions to ensure the safety of workers and the traveling public

The Engineer may require revisions to the Contractor's TCP or associated MHTs if it is determined that implementation of the plan results in excessive delays to the traveling public. New or revised MHTs shall be submitted at least seven days before implementation, unless otherwise approved by the Engineer.

Allowable delays, working times, minimum lane requirements, and allowable closures shall be in accordance with Revision of Section 108- Prosecution and Progress.

The Contractor shall develop and maintain a MHT for pedestrian circulation. The Contractor shall provide and maintain a safe environment for pedestrians surrounding work zones at all times. The Contractor shall provide and maintain appropriate pedestrian detour signage at each intersection to direct pedestrians. Where a segment of the sidewalk is closed during the construction, a new pathway or the sidewalk on the opposite side of the street shall be maintained with proper signage that marks detour routes for pedestrians. MHTs shall detail all of the Pedestrian devices and fence necessary for that operation.

All traffic control for night work shall be in accordance with the MUTCD. Adequate illumination of flagging stations shall include the use of light plants whenever night flagging operations are being conducted, as approved by the Engineer. Night work lighting shall be paid per Revision of Section 632 Night Lighting.

All available public parking is reserved for the public. Contractor and subcontractor employee personal vehicle parking is prohibited in these locations. Parking of Contractor or subcontractor vehicles or construction equipment in existing public parking space is allowed only in the zones that are closed for construction. Parking of Contractor, subcontractor or employee construction or personal vehicles (or construction equipment) in private residential or business parking space is also strictly prohibited. Suitable transportation to the work site for personnel whose vehicles are parked off site shall be provided by the Contractor.

The Contractor shall not have temporary traffic control on site during any project shutdown period.

4
Traffic Control Plan - General

Access Maintenance Plan

Unless otherwise included in the plans or directed by the Engineer, the Contractor shall maintain continuous access to all roadways, side streets, walkways, alleyways, driveways, and other sidewalks and pathways at all times. Sidewalks shall remain open to pedestrians to the greatest extent practicable. If a sidewalk has to be closed, an alternate access shall be provided with appropriate signage. To the greatest extent possible, driveways shall be re-constructed when the access is closed for concrete pavement placement.

At least 7 calendar days prior to beginning work on any driveway or private access, the Contractor shall notify each business or resident of the expected construction schedule.

The Contractor shall develop an Access Maintenance Plan (AMP) in coordination with all affected owners and tenants. A sample form of the AMP shall be developed for this purpose by the Contractor and submitted to the Engineer for review and approval. The AMP shall address any special needs any business or residence has for Americans with Disabilities Act (ADA) access or any other special needs. A place on the AMP form shall address special needs and ADA issues.

The AMP shall detail the effects to the accesses including closing dates, time and duration, and, if applicable, barricades, fencing and temporary means of access with all affected owners and tenants in a work area. The AMP shall include the address, the station location, the work periods affected, and show documentation of coordination, including the appropriate property owner signatures, and the date of the contact. Contact information regarding the companies that make frequent deliveries to the affected businesses shall be obtained and details of access changes shall be provided to these companies by the Public Information Manager along with other routine public information.

The signed AMP shall be submitted, as part of the corresponding method of handling traffic, to the Engineer for approval one week prior to the start of any work which will affect the signatory properties. If the Contractor is unable to obtain approval and signatures, documentation of “good faith efforts” to obtain said approval and signatures shall be submitted.

5
Traffic Control Plan - General

The Contractor will not be allowed to begin work until the plan is accepted. If Contractor does not have approved AMP forms completed for all accesses within a work area, the Engineer may delay progress of work for the affected accesses. Such delay shall not be the basis for a claim for additional contract time or compensation.

Oversize Load Restrictions
It is anticipated that oversize loads will need to be accommodated during the construction of this project. The Contractor, the City, and the Engineer will coordinate oversize load restrictions that assure the least interference with oversize loads using US 6.

Other Special Traffic Control Requirements
Signs and stands shall not be permitted to be left on sidewalks or landscaped areas overnight. Equipment shall not be stored within 20 feet of the currently traveled roadway lanes.

The Contractor shall provide each flagger, the Traffic Control Supervisor, and the Engineer with a minimum 5-watt VHF radio in order to provide adequate communications during construction. The radios shall have sufficient range to communicate a minimum of 5 miles. The MHT submitted by the Contractor shall address radio communications.

Traffic Control Management shall include all Traffic Control Supervisors and helpers necessary to perform the work. There shall be a minimum of one helper for each Traffic Control Supervisor required for the project. At least one Traffic Control Supervisor and one Helper shall be on site at all times when construction activities are underway

Although Traffic Control items such as Variable Message Sign Panels, Traffic Control Management or Traffic Control Inspection, and construction traffic control signs may be required and used prior to the beginning of contract time, no payment will be made for the use of any item prior to the beginning of contract time. All work performed prior to commencement of Contract time shall be considered subsidiary to mobilization.

Helpers for the Traffic Control Management item may give flagger breaks. However, the time shall be included in the item for Traffic Control Management and shall not be paid as additional flagging hours. The TCS helper(s) shall be paid Traffic / Sign Laborer wages. The Traffic Control Supervisor shall be paid Truck Driver / Pickup Truck (Includes Pilot and Sign/Barricade Truck) wages for all hours that they are on the project.

6
Traffic Control Plan - General

The Contractor shall provide Traffic Control Supervisor(s) (TCS) with at least one year of experience, as accepted by the Engineer. A copy of the certification of the Traffic Control Supervisor(s) shall be provided to the Engineer at least two days prior to the project preconstruction conference.

A meeting will be scheduled each working day with the Contractor's superintendent, the Traffic Control Supervisor(s), and the Engineer for discussion, submittal and approval of the MHT(s) for the next day's scheduled work. Work that has not been scheduled and requires a MHT that has not been approved shall not be allowed. Work which does not require a MHT may proceed if approved by the Engineer.

The required TCS Diary shall be submitted to the Engineer by 10:00 a.m. each following day and shall include a listing of all flagging hours, labor hours, and traffic control devices in use.

All Construction Zone Traffic Control Devices shall be continuously maintained in accordance with Section 630 of the Standard Specifications. The TCS shall establish a set maintenance and cleaning schedule. A copy of the maintenance and cleaning schedule shall be provided to the Engineer.

Truck turn-around locations shall be as approved by the Engineer. All truck turn-around locations adjacent to project limits shall also be included in an MHT. Traffic Control Devices and Flagging required for truck turn-around locations will not be paid for separately but shall be included in the work.

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

1
Force Account Items

Description

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

Basis of Payment

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

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

Force Account Item	Estimated Quantity	Amount
F/A Minor Contract Revisions	F.A.	$150,000*
F/A On-The-Job-Trainee	F.A.	$3,000
F/A Furnish & Install Electrical Service	F.A.	$25,000
F/A Landscaping	F.A.	$5,000
F/A Removal of Obstructions	F.A.	$24,000*
F/A Erosion Control	F.A.	$5,000
F/A Hazardous Waste Disposal (Off-Site Disposal)	F.A.	$5,000
F/A Environmental Health & Safety Management	F.A.	$5,000

2
Force Account Items

Description

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

F/A On-The-Job Trainee - Cost of maintaining on-the-job training program in accordance with the Standard Special Provision.

F/A Furnish & Install Electrical Service - Cost for Xcel Energy to make the final connections of the service lateral to the transformer and for the electric utility to install the new power supply.

F/A Landscaping – This force account will be used to reimburse the Contractor for landscape replacement work authorized and approved by the Engineer, which is not included in the Contract plans or specifications and is necessary to accomplish the scope of work of this Contract

F/A Removal of Obstructions – Cost for removing business signs, sign foundations, and associated appurtenances if the property owner does not remove their property in advance of construction. All items shall be approved by the engineer prior to removal, or they will be at no cost to the project. The Contractor shall coordinate with the property owner to determine if they would like to keep the sign after removal. If the owner would like to keep the sign, the Contractor shall coordinate with the owner on a stockpile location.

F/A Erosion Control – Water Control and Supplemental erosion control measures suggested by the Erosion Control Supervisor but not provided for in the contract plans or specifications. All items shall be approved by the Engineer prior to installation, or they will be at no cost to the project.

F/A Hazardous Waste Disposal (Off-Site Disposal) – This force account will be used to reimburse the Contractor as described in Project Special Provision, Revision of Section 250 – Environmental, Health, and Safety Management

F/A Environmental Health & Safety Management – Cost for managing and disposing LBP materials identified on the project in accordance with Section 250.

1
Utilities and Irrigation

The known utilities within the limits of this project are:

Utility Company Address	**Contact Name** **Email**	**Telephone**
City of Grand Junction 244 North 7th Street Grand Junction, CO 81501	Ken Haley kennethh@gjcity.org	970-244-1543
Clearnetworx 301 N. Cascade Avenue Montrose, CO 81401	Andy Carver andy.carver@deeplydigital.com	970-361-4254
Lumen Communications c/o Chris Johnson 2524 Blichmann Ave Grand Junction, CO 81505	Robert McLeod rmcleod@congruex.com	303-949-2187
MCI/Verizon 10000 Park Meadows Drive Lone Tree, CO 80124	Lane Grady lane.grady@verizon.com	303-827-9756
Mesa County 2785 US-50 Grand Junction, CO 81503	Federico Vargas federico.vargas@mesacounty.us	970-986-0097
Spectrum Local Address: 2502 Foresight Cir, Grand Junction, CO 81505 **For Legal and Permitting:** Spectrum Pacific West, LLC 12405 Powerscourt Dr St. Louis, MO 63131	Mark Kostelecky Mark.Kostelecky@spectrum.com	970-244-1590
Unite Private Networks 9380 Station Street, Suite 100 Lone Tree, CO 80124	Robert Flores Robert.Flores@segrafiber.com	719-620-3790
Ute Water Conservancy District 2190 H ¼ Road, Grand Junction, CO 81505	Dave Priske dpriske@utewater.org	970-242-7491

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Utilities and Irrigation

Utility Company Address	Contact Name Email	Telephone
Xcel Energy Western Division 2538 Blichmann Ave Grand Junction, CO 81505	Michael Castro (Electric and Gas) Michael.A.Castro@xcelenergy.com	970-260-6804

The work described in these plans and specifications will require full cooperation between the Contractor and the utility companies, in accordance with Subsection 105.11, in conducting their respective operations so the utility work can be completed with minimum delay to all parties concerned.

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 — General:

Utilities are depicted on these plans in accordance with their achieved “Quality Levels” as defined in the American Society of Civil Engineers’ document ASCE 38, “Standard Guideline for the Collection and Depiction of Existing Subsurface Utility Data.” The Contractor’s attention is directed to subsection 105.11 of the Standard Specifications concerning utilities.

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.

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

3
Utilities and Irrigation

General Responsibilities Of The Contractor

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 Colorado 811 at phone no. 811 or 1-800- 922-1987, to have locations of registered utility 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.

Prior to excavating, the Contractor shall positively locate (through potholing as 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 shall modify construction plans to avoid existing underground facilities as needed, and as approved by the Engineer. Please note that Colorado 811 (formerly Utility Notification Center of Colorado (UNCC)) marks only its members' facilities. Other facilities, such as ditches and drainage pipes may exist, and it is the Contractor's responsibility to investigate, locate and avoid such facilities.

The Contractor shall coordinate project construction with the utility owners for each utility work element listed in Part 2 below. For utility work elements to be coordinated during construction, the Contractor shall perform preparatory work specified in Part 2 for each utility work element and provide an accurate construction schedule to the owner of each impacted utility. Conduct necessary utility coordination meetings and provide other necessary accommodations as directed by the Project Engineer. Notify each utility owner in writing, with a copy to the Project Engineer, immediately prior to the time the utility work must begin to meet the project schedule.

The Contractor shall work with utility owners to coordinate concurrent traffic control activities as needed on the corridor during construction to maintain a safe and operational work site.

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The Contractor shall remove any abandoned utility facilities as necessary to accommodate construction and shall not be paid for separately but shall be included in the work unless otherwise specified in the plans.

To the extent practicable, the Contractor shall endeavor to achieve the vertical clearance specified by the utility owner when crossing their facilities. A minimum vertical clearance of 18 inches should be maintained between crossing utilities where feasible.

The Contractor shall submit as-built drawings to the City of Grand Junction at the completion of construction for review.

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 with ample notice prior to commencing activities in the vicinity of their facilities. The Contractor will work with the affected utilities on the appropriate vertical clearances which shall be maintained wherever feasible. Any additional work performed by the Contractor on behalf of the impacted utility company shall not be paid for by the project but shall be paid by the utility company requiring the work, unless otherwise agreed to in writing by the Engineer.

General Responsibility of Utility Owners

Utility owners are responsible for obtaining all necessary permits from the Colorado Department of Transportation (CDOT) and/or the City of Grand Junction, as required. All utility work, traffic control, and restoration shall be performed in accordance with the latest CDOT Standard Specifications and Details. This work will be performed by the utility owners as necessary to avoid conflicts with construction activities.

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Utility owners shall comply with the schedule requirements of the Contractor and make every effort not to impact the overall construction schedule. Unless otherwise approved or directed by the Engineer, abandoned above ground appurtenances such as pedestals shall be removed and abandoned underground utilities shall be abandoned in place.

Utility owners shall coordinate the support/protection of buried and/or overhead utilities encountered on-site. This work is expected to be coordinated with construction.

Utility owners shall support the locating and potholing of any potential conflicts with buried utility facilities and proposed construction, and relocate or adjust such facilities, as required. Complete relocation and/ or adjustments of facilities as scheduled with the Contractor. This schedule time shall be determined by the Contractor and Utility owner. Utility owner is responsible for coordinating with the Contractor.

Utility owner shall provide standby when construction is near utility owner facilities as required. Utility owners shall coordinate with the Contractor if any facility is found to conflict with the proposed project improvements. If a relocation or adjustment is necessary, utility owners shall schedule and facilitate the work by their own forces and are responsible for coordinating with the Contractor.

Part 2 — Utility Relocation Information for Contractor and Utility Owners

This section outlines known utility conflicts by owner, the planned method of resolution, and the corresponding roles, responsibilities, and timing considerations for both the Contractor and the Utility owner.

City of Grand Junction – Water
Existing City of Grand Junction water facilities identified as being impacted by the project are located west of 29 Road.

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Project improvements require the relocation of existing City of Grand Junction water meters at the following locations:

- STA. 140+66, identified as 1-W-001 in the plans
- STA. 141+62, identified as 1-W-002 in the plans
- STA. 141+75, identified as 1-W-003 in the plans
- STA. 142+21, identified as 1-W-004 in the plans
- STA. 144+46, identified as 1-W-006 in the plans
- STA. 156+58, identified as 1-W-009 in the plans
- STA. 157+32, identified as 1-W-010 in the plans

Project improvements require the relocation of an existing City of Grand Junction water hydrant at the following location:

- STA. 143+60, identified as 1-W-005 in the plans

Project improvements require the adjustment to final grade of existing City of Grand Junction water valves at the following locations:

- STA. 145+05, identified as 1-W-007 in the plans
- STA. 145+07, identified as 1-W-008 in the plans

The Contractor shall perform the work listed below:

The Contractor shall protect in place City of Grand Junction water facilities as shown in the plans. For all meter and hydrant resets shown below, the Contractor shall comply with Revision of Section 210 – Reset Meter and Fire Hydrant and the attached appendices.

At conflict locations 1-W-002, 1-W-003, and 1-W-004, the Contractor shall reset City of Grand Junction water meters south into the tree lawn as shown on the plans.

At conflict locations 1-W-001, 1-W-006, 1-W-009 and 1-W-010, the Contractor shall reset City of Grand Junction water meters north of the proposed sidewalk as shown on the plans.

At conflict location 1-W-005, the Contractor shall reset the City of Grand Junction water hydrant into the tree lawn as shown on the plans.

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At conflict locations 1-W-007 and 1-W-008, the Contractor shall adjust City of Grand Junction water valves to final grade as shown on the plans.

Timing: The Contractor shall notify the City of Grand Junction at least two (2) weeks in advance of work being conducted in the vicinity of City of Grand Junction facilities.

The Utility owner shall perform the work listed below:

The City of Grand Junction shall inspect utility work performed by the Contractor listed above. The Contractor shall coordinate inspections with City of Grand Junction forces by providing notice 5 days prior to the anticipated inspection date.

City of Grand Junction – Traffic
Existing City of Grand Junction traffic facilities identified as being impacted by the project include a fiber pull box located at the northeast corner of 29 Road and North Avenue and a signal cabinet located at the northeast corner of 29 ½ Road and North Avenue. The signal cabinet is fed by an Xcel-owned pull box.

Project improvements require the relocation of the existing Xcel-owned pull box at the following location, as described in the Xcel section below. Following its relocation, the signal cabinet shall be reconnected:

- STA. 191+77, identified as 2-E-022 in the plans

Project improvements require the adjustment to final grade of the existing City of Grand Junction fiber pull box at the following location:

- STA. 165+22, identified as 1-E-013 in the plans

Contractor shall perform the work listed below:

The Contractor shall protect in place City of Grand Junction traffic facilities as shown in the plans.

2-E-022: The Contractor shall confirm that City of Grand Junction and Xcel forces have completed the relocation which was to have been completed prior to construction as described below.

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1-E-013: The Contractor shall adjust the City of Grand Junction fiber pull box to final grade as shown on the plans.

Timing: The Contractor shall notify the City of Grand Junction at least two (2) weeks in advance of work being conducted in the vicinity of City of Grand Junction facilities.

The Utility Owner shall perform the work listed below:

The City of Grand Junction shall coordinate with CDOT and obtain all necessary permits required to perform the relocation work.

2-E-022: Xcel and City of Grand Junction forces shall coordinate all work associated with the pull box relocation and service line reconnection. Following Xcel's pull box relocation, City of Grand Junction forces shall reconnect its service line from the signal cabinet to the new pull box location prior to construction.

1-E-013: City of Grand Junction forces shall inspect utility work performed by the Contractor listed above.

Timing: The Contractor shall coordinate inspections with City of Grand Junction forces and provide notice to City of Grand Junction 5 days prior to each inspection.

Clearnetworx
Existing Clearnetworx communication facilities identified as being impacted by the project are located at the southeast and southwest corners of the North Avenue and Morning Glory Lane intersection. Additional impacted Clearnetworx facilities include underground and overhead attachments to Lumen- and Xcel-owned poles along the corridor.

Project improvements require the relocation of existing Clearnetworx pull boxes at the following locations:

- STA. 174+31, identified as 7-C-001 in the plans
- STA. 175+00, identified as 7-C-002 in the plans

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Project improvements require the relocation of existing Xcel-owned poles with attached Clearnetworx facilities at the following locations, as described in the Xcel section below:

- STA. 144+00, identified as 2-E-001 in the plans
- STA. 164+03, identified as 2-E-004 in the plans
- STA. 178+50, identified as 2-E-012 in the plans
- STA. 184+57, identified as 2-E-017 in the plans
- STA. 190+73, identified as 2-E-021 in the plans
- STA. 197+83 identified as 2-E-038 in the plans
- STA. 199+33 identified as 2-E-039 in the plans
- STA. 200+76 identified as 2-E-040 in the plans
- STA. 202+16 identified as 2-E-042 in the plans
- STA. 204+25 identified as 2-E-043 in the plans

Project improvements require the relocation of an existing Lumen-owned pole with attached Clearnetworx and Xcel facilities at the following location, as described in the Lumen and Xcel sections below:

- STA. 193+00, identified as 3-C-022 / 2-E-056 in the plans. Lumen facilities are to be removed from the pole, after which ownership of the pole will transfer to Xcel. Clearnetworx facilities are anticipated to remain on the pole during the ownership transfer and shall be coordinated with Xcel as part of the pole relocation at conflict location 2-E-056.

The Contractor shall perform the work listed below:

The Contractor shall confirm that Clearnetworx and Xcel have completed the relocations which were to have been completed prior to construction as described below.

The Contractor shall protect in place Clearnetworx facilities as shown in the plans.

Timing: The Contractor shall notify Clearnetworx at least two (2) weeks in advance of work being conducted in the vicinity of Clearnetworx facilities.

The Utility Owner shall perform the work listed below:

Clearnetworx shall coordinate with CDOT and obtain all necessary permits required to perform the relocation work.

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7-C-001, 7-C-002: After receiving notice that the proposed relocation has been staked in the field, Clearnetworx forces shall relocate the existing pull boxes south of the proposed sidewalk as shown in the plans. This work is anticipated to require approximately two (2) to three (3) working days, barring unforeseen circumstances. Relocation is anticipated to occur within one (1) to two (2) weeks following notification from the Engineer and is anticipated to be completed within approximately two (2) to three (3) working days, barring unforeseen circumstances.

Clearnetworx shall coordinate with Xcel regarding the relocation of Clearnetworx underground and overhead facilities on Xcel-owned poles, and anticipates the aerial relocation work will require approximately one (1) to two (2) working days once all new Xcel poles are installed and ready for transfer. Coordination with other attached utility owners shall be required as it relates to scheduling and sequencing of Clearnetworx's work.

Timing: The above work shall be completed prior to construction.

Lumen
Existing Lumen communication facilities identified as being impacted by the project are located throughout the corridor. These facilities include underground and overhead lines attached to Lumen-owned poles, as well as underground and overhead lines attached to Xcel-owned poles. Additional impacted Lumen facilities consist of surface features including manholes and pedestals.

Certain underground facilities include TDUC installations that are present within the corridor but are not anticipated to be directly impacted by the project. These installations are understood to consist of multiple conduits, likely concrete-encased, are of critical nature, and have limited ability for adjustment.

Project improvements require the removal of existing Lumen-owned poles at the following locations:

- STA. 170+40, identified as 3-C-031 in the plans
- STA. 172+24, identified as 3-C-005 in the plans
- STA. 180+00, identified as 3-C-007 in the plans
- STA. 184+83, identified as 3-C-023 in the plans
- STA. 202+02, identified as 3-C-030 in the plans
- STA. 204+08, identified as 3-C-027 in the plan

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Project improvements require the relocation of existing Xcel-owned poles with attached Lumen facilities at the following locations, as described in the Xcel section below:

- STA. 144+00, identified as 2-E-001 in the plans
- STA. 179+25, identified as 2-E-013 in the plans
- STA. 197+83 identified as 2-E-038 in the plans

Project improvements require the adjustment to final grade of the existing Lumen telephone manholes at the following locations:

- STA. 174+44, identified as 3-C-006 in the plans
- STA. 182+50, identified as 3-C-008 in the plans

Project improvements require the removal of existing Lumen pedestals at the following locations:

- STA. 154+73, identified as 3-C-029 in the plans
- STA. 156+88, identified as 3-C-001 in the plans
- STA. 159+30, identified as 3-C-002 in the plans
- STA. 169+53, identified as 3-C-004 in the plans
- STA. 184+85, identified as 3-C-024 in the plans
- STA. 188+92, identified as 3-C-025 in the plans
- STA. 190+22, identified as 3-C-013 in the plans
- STA. 190+50, identified as 3-C-009 in the plans
- STA. 191+58, identified as 3-C-011 in the plans
- STA. 193+00, identified as 3-C-028 in the plans

Project improvements require the removal and replacement of existing Lumen pedestals at the following locations:

- STA. 205+43, identified as 3-C-018 in the plans
- STA. 206+78, identified as 3-C-019 in the plans

Project improvements require the removal of Lumen facilities from an existing Lumen-owned pole and subsequent transfer of ownership at the following location:

- STA. 193+00, identified as 3-C-022 / 2-E-056 in the plans. Clearnetworx and Xcel facilities will remain attached to the pole. Following removal of Lumen facilities, ownership of the pole will transfer to Xcel as part of the planned pole relocation described in the Xcel section below.

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The Contractor shall perform the work listed below:

The Contractor shall confirm that Lumen and Xcel forces have completed the relocations which were to have been completed prior to construction as described below.

The Contractor shall protect in place Lumen facilities as shown in the plans. Lumen TDUC facilities shall be protected in place, and the Contractor shall not assume that TDUC facilities can be adjusted in place. If conflicts with TDUC facilities are encountered, the Contractor shall notify the Engineer.

If the Contractor encounters an abandoned Lumen facility during construction, the Contractor shall notify the Engineer and Lumen. Lumen shall field verify the facility and remove the abandoned facility as needed.

Timing: The Contractor shall notify Lumen at least two (2) weeks in advance of work being conducted in the vicinity of Lumen facilities.

3-C-006 and 3-C-008: The Contractor shall notify Lumen at least two (2) weeks in advance of when the telephone manholes are ready for final grade adjustment.

The Utility Owner shall perform the work listed below:

Lumen shall coordinate with CDOT and obtain all necessary permits required to perform the relocation work.

At conflict locations 3-C-006 and 3-C-008, Lumen shall adjust the existing Lumen telephone manholes to final grade and update the lids to be flush with the adjacent finished ground.

At conflict location 2-E-001, Lumen shall remove its existing overhead facilities currently attached to the Xcel–owned pole prior to Xcel performing the pole relocation.

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At conflict location 3-C-022 / 2-E-056, Lumen shall remove its facilities from the existing Lumen-owned pole. Lumen shall coordinate with Xcel and Clearnetworx regarding the timing and sequencing of this work to avoid disruption to existing attached facilities and ensure proper sequencing of work. Following removal of Lumen's facilities, Lumen shall transfer ownership of the pole. The pole shall remain in service with existing attached facilities from Clearnetworx and Xcel and shall become an Xcel-owned pole identified as conflict location 2-E-056. After Lumen has removed its facilities and ownership has been transferred, Xcel shall relocate the pole at conflict location 2-E-056 as shown on the plans.

Lumen shall coordinate with Xcel regarding the relocation of Lumen underground and overhead facilities on Xcel-owned poles. Coordination with other attached utility owners shall be required as it relates to scheduling and sequencing of Lumen's work.

Lumen shall coordinate all required approvals, customer notifications, and service interruptions associated with the relocation work.

Timing: The above work shall be completed prior to construction. Lumen shall adjust the telephone manhole at conflict locations 3-C-006 and 3-C-008 in coordination with construction.

MCI/Verizon
Colorado 811 notification identified MCI/Verizon as a utility owner in the area. However, SUE investigations did not locate any MCI/Verizon facilities within the project limits. Verizon has reviewed the plans and confirmed that the proposed work does not impact MCI/Verizon infrastructure. No conflicts are anticipated.

Contractor shall protect any MCI/Verizon facilities encountered during construction.

Mesa County
An existing Mesa County service line supplies power to their sign at the northeast corner of North Avenue and 29 ½ Road and is connected to an Xcel-owned pull box.

Project improvements require the relocation of the existing Xcel-owned pull box at the following location, as described in the Xcel section below:

- STA. 191+77, identified as 2-E-022 in the plans

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The Contractor shall perform the work listed below:

2-E-022: The Contractor shall confirm that Mesa County and Xcel forces have completed the relocation which was to have been completed prior to construction as described below.

The Contractor shall protect in place Mesa County facilities as shown in the plans.

The Utility Owner shall perform the work listed below:

Mesa County shall coordinate with CDOT and obtain all necessary permits required to perform the relocation work.

2-E-022: Xcel and Mesa County forces shall coordinate all work associated with the pull box relocation and service line reconnection. Following Xcel's pull box relocation, Mesa County shall cut, pull, and reconnect its service line to the new pull box location.

Timing: The above work shall be completed prior to construction.

Spectrum
Existing Spectrum communication facilities identified as being impacted by the project include a pedestal located at the northeast corner of 29 ½ Road and North Avenue, as well as underground and overhead facilities attached to Xcel-owned poles throughout the corridor.

Project improvements require the relocation of an existing Spectrum pedestal at the following location:

- STA. 191+76, identified as 8-C-001 in the plans

Project improvements require the relocation of existing Xcel-owned poles with attached Spectrum facilities at the following locations, as described in the Xcel section below:

- STA. 144+00, identified as 2-E-001 in the plans
- STA. 164+03, identified as 2-E-004 in the plans
- STA. 178+50, identified as 2-E-012 in the plans
- STA. 179+25, identified as 2-E-013 in the plans
- STA. 190+73, identified as 2-E-021 in the plans
- STA. 197+08, identified as 2-E-029 in the plans (underground attachment only)

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- STA. 197+83, identified as 2-E-038 in the plans
- STA. 199+33, identified as 2-E-039 in the plans
- STA. 200+76, identified as 2-E-040 in the plans
- STA. 202+16, identified as 2-E-042 in the plans
- STA. 204+25, identified as 2-E-043 in the plans
- STA. 204+46, identified as 2-E-044 in the plans (underground attachment only)

The Contractor shall perform the work listed below:

The Contractor shall confirm that Spectrum has completed the relocations which were to have been completed prior to construction as described below.

The Contractor shall protect in place Spectrum facilities as shown in the plans.

Timing: The Contractor shall notify Spectrum at least two (2) weeks in advance of work being conducted in the vicinity of Spectrum facilities.

The Utility Owner shall perform the work listed below:

Spectrum and UPN plan to combine work with one Contractor for multi-entity pole transfer relocations, utilizing one consistent traffic control mobilization.

Spectrum shall coordinate with CDOT and obtain all necessary permits required to perform the relocation work.

8-C-001: Spectrum shall relocate the existing pedestal north of the proposed sidewalk within the City of Grand Junction’s multipurpose easement prior to construction.

Spectrum shall coordinate with Xcel regarding the relocation of Spectrum underground and overhead facilities on Xcel-owned poles. Coordination with other attached utility owners shall be required as it relates to scheduling and sequencing of Spectrum’s work.

Spectrum shall coordinate all required approvals, customer notifications, and service interruptions associated with the relocation work.

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Timing: The above work shall be completed prior to construction. Mobilization for UPN/Spectrum work will be dependent on Xcel's notification that poles are ready for transfer.

UPN
Existing UPN communication facilities identified as being impacted by the project include overhead service attachments to Xcel-owned poles located throughout the corridor.

Project improvements require the relocation of existing Xcel-owned poles with attached UPN facilities at the following locations, as described in the Xcel section below:

- STA. 144+00, identified as 2-E-001 in the plans
- STA. 164+03, identified as 2-E-004 in the plans
- STA. 178+50, identified as 2-E-012 in the plans
- STA. 184+57, identified as 2-E-017 in the plans
- STA. 190+73, identified as 2-E-021 in the plans
- STA. 197+83 identified as 2-E-038 in the plans
- STA. 199+33 identified as 2-E-039 in the plans
- STA. 200+76 identified as 2-E-040 in the plans
- STA. 202+16 identified as 2-E-042 in the plans
- STA. 204+25 identified as 2-E-043 in the plans

The Contractor shall perform the work listed below:

The Contractor shall confirm that UPN and Xcel forces have completed the relocations which were to have been completed prior to construction as described below.

The Contractor shall protect in place UPN facilities as shown in the plans.

Timing: The Contractor shall notify UPN at least two (2) weeks in advance of work being conducted in the vicinity of UPN facilities.

The Utility Owner shall perform the work listed below:

UPN and Spectrum plan to combine work with one Contractor for multi-entity pole transfer relocations, utilizing one consistent traffic control mobilization.

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UPN shall coordinate with CDOT and obtain all necessary permits required to perform the relocation work.

UPN shall coordinate with Xcel regarding the relocation of UPN overhead facilities on Xcel-owned poles. Coordination with other attached utility owners shall be required as it relates to scheduling and sequencing of UPN's work.

Timing: The above work shall be completed prior to construction. Mobilization for UPN/Spectrum work will be dependent on Xcel's notification that poles are ready for transfer. Following review of the scope of work, the UPN portion of the relocation is estimated to take approximately 7 days and not more than two calendar weeks after the notification from Xcel, barring unforeseen circumstances.

Ute
Existing Ute water facilities identified as being impacted by the project are located east of 29 Road.

Project improvements require the relocation of existing Ute water meters at the following locations:

- STA. 169+41, identified as 4-W-002 in the plans
- STA. 171+07, identified as 4-W-004 in the plans
- STA. 171+51, identified as 4-W-005 in the plans
- STA. 172+53, identified as 4-W-006 in the plans
- STA. 177+40, identified as 4-W-009 in the plans
- STA. 177+60, identified as 4-W-033 in the plans
- STA. 178+04, identified as 4-W-011 in the plans
- STA. 180+58, identified as 4-W-013 in the plans
- STA. 193+26, identified as 4-W-034 in the plans
- STA. 194+83, identified as 4-W-016 in the plans
- STA. 193+91, identified as 4-W-017 in the plans
- STA. 196+50, identified as 4-W-018 in the plans
- STA. 197+94, identified as 4-W-022 in the plans
- STA. 201+46, identified as 4-W-025 in the plans

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Project improvements require the relocation of existing Ute water hydrants at the following locations, to be completed prior to construction.

- STA. 167+75, identified as 4-W-001 in the plans
- STA. 178+30, identified as 4-W-008 in the plans
- STA. 177+91, identified as 4-W-010 in the plans
- STA. 187+42, identified as 4-W-015 in the plans

Project improvements require the relocation of an existing Ute water hydrant at the following location, to be coordinated with construction.

- STA. 174+39, identified as 4-W-007 in the plans

Project improvements require the adjustment to final grade of an existing Ute water hydrant at the following location:

- STA. 180+45, identified as 4-W-032 in the plans

Project improvements require the relocation of the existing Ute water manhole at the following location:

- STA. 169+50, identified as 4-W-003 in the plans

The Contractor shall perform the work listed below:

The Contractor shall protect in place Ute facilities as shown in the plans.

The Contractor shall allow Ute to perform utility relocation work within the limits of the Contractor's traffic control setup, as applicable.

The Contractor shall complete required staking and grading associated with each relocation area prior to notifying Ute that the site is ready for relocation work.

The Contractor shall provide Ute at least one (1) week advance notice prior to a relocation area being ready for work.

The Contractor shall not impact existing Ute facilities until Ute relocation work has been completed.

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The Contractor shall maintain coordination with Ute throughout construction to support efficient scheduling and sequencing of relocation work.

Timing: Ute relocation work is anticipated to occur during construction in coordination with the Contractor's sequencing and traffic control operations. The Contractor shall notify Ute at least two (2) weeks in advance of construction activity commencing near Ute facilities and shall provide at least one (1) week advance notice prior to individual relocation areas being ready for work.

The Utility Owner shall perform the work listed below:

Ute shall coordinate with CDOT and obtain all necessary permits required to perform the relocation work.

Ute shall coordinate any required notifications or coordination with adjacent property owners associated with relocation work.

Ute relocation work shall be performed in accordance with the Contractor's traffic control requirements and applicable project safety measures.

Following notification from the Contractor that a relocation area is ready, Ute is anticipated to complete individual meter pit and hydrant relocations within approximately two (2) working days, subject to field conditions and coordination requirements.
Ute shall maintain coordination with the Contractor throughout construction to support efficient scheduling and sequencing of relocation work.

At conflict locations 4-W-002, 4-W-004, 4-W-006, 4-W-009, 4-W-011, 4-W-017, 4-W-022, 4-W-025, Ute forces shall relocate the existing Ute water meters south of the proposed sidewalk as shown on the plans.

At conflict locations 4-W-005, 4-W-016, 4-W-033, 4-W-034, Ute forces shall relocate the existing Ute water meters north of the proposed sidewalk as shown on the plans.

At conflict location 4-W-013, Ute forces shall relocate the existing Ute water meter north of the proposed sidewalk into the City of Grand Junction's multipurpose easement as shown on the plans.

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At conflict location 4-W-018, Ute forces shall relocate the existing Ute water meter south of the proposed sidewalk and bus stop amenities pad as shown on the plans.

At conflict location 4-W-003, Ute forces shall relocate the existing Ute water manhole north of the proposed sidewalk as shown on the plans.

At conflict location 4-W-001, Ute forces shall relocate the existing Ute water hydrant north of the proposed sidewalk into the City of Grand Junction's multipurpose easement as shown on the plans.

At conflict locations 4-W-007 and 4-W-010, Ute forces shall relocate the existing Ute water hydrants south of the proposed sidewalk as shown on the plans.

At conflict location 4-W-008, Ute forces shall relocate the existing Ute water hydrant east of the proposed sidewalk as shown on the plans.

At conflict location 4-W-013, Ute forces shall relocate the existing Ute water hydrant north of the proposed sidewalk as shown on the plans.

At conflict location 4-W-032, Ute forces shall adjust the existing hydrant to final grade.

Timing: Ute relocation work is anticipated to occur during construction in coordination with the Contractor's sequencing and traffic control operations. The Contractor shall notify Ute at least two (2) weeks in advance of construction activity commencing near Ute facilities and shall provide at least one (1) week advance notice prior to individual relocation areas being ready for work.

Xcel - Electric

Existing Xcel electric facilities identified as being impacted by the project are located throughout the corridor. These facilities include underground and overhead lines attached to Xcel-owned poles. Additional impacted Xcel facilities consist of surface features including light poles, pull boxes and transformers.

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Project improvements require the relocation of existing Xcel poles at the following locations:

- STA. 144+00, identified as 2-E-001 in the plans
- STA. 164+03, identified as 2-E-004 in the plans
- STA. 168+08, identified as 2-E-007 in the plans
- STA. 178+00, identified as 2-E-011 in the plans
- STA. 178+50, identified as 2-E-012 in the plans
- STA. 179+25, identified as 2-E-013 in the plans
- STA. 184+57, identified as 2-E-017 in the plans
- STA. 190+73, identified as 2-E-021 in the plans
- STA. 187+84, identified as 2-E-023 in the plans
- STA. 190+22, identified as 2-E-024 in the plans
- STA. 197+08, identified as 2-E-029 in the plans
- STA. 197+83, identified as 2-E-038 in the plans
- STA. 199+33, identified as 2-E-039 in the plans
- STA. 200+76, identified as 2-E-040 in the plans
- STA. 202+16, identified as 2-E-042 in the plans
- STA. 204+25, identified as 2-E-043 in the plans
- STA. 204+46, identified as 2-E-044 in the plans

Project improvements require the relocation of an existing Xcel guy wire attached to an Xcel-owned pole at the following location:

- STA. 179+63, identified as 2-E-057 in the plans
- STA. 200+60 identified as 2-E-037 in the plans

Project improvements require the relocation of the existing light pole at the following location:

- STA. 157+91, identified as 2-E-002 in the plans

Project improvements require the removal of the existing light pole at the following location:

- STA. 158+40, identified as 2-E-003 in the plans

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Project improvements require the adjustment to final grade of the existing Xcel transformer at the following location:

- STA. 165+82, identified as 2-E-006 in the plans

Project improvements require the adjustment to final grade of the existing Xcel pull box at the following location:

- STA. 165+42, identified as 2-E-058 in the plans

Project improvements require the relocation of the existing pull box at the following location:

- STA. 191+77, identified as 2-E-022 in the plans

Project improvements require the adjustment of existing Xcel pole anchoring at the following location:

- STA. 188+78, identified as 2-E-020 in the plans

Project improvements require the relocation of an existing pole that will become Xcel-owned, with attached Clearnetworx and Xcel facilities, at the following location, as described in the Lumen section above.

- STA. 193+00, identified as 3-C-022 / 2-E-056 in the plans. The existing pole is currently Lumen-owned. Following removal of Lumen facilities and transfer of ownership, Xcel shall assume ownership of the pole and perform the required relocation.

The Contractor shall perform the work listed below:

The Contractor shall confirm that Xcel and other affected utility owners have completed the relocations which were to have been completed prior to construction as described below.

The Contractor shall protect in place Xcel facilities as shown in the plans.

2-E-006, 2-E-058: Upon completion of construction in affected areas, the Contractor shall notify Xcel at least two (2) weeks prior to when the transformer and pull box are ready for final grade adjustment.

The Utility Owner shall perform the work listed below:

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Utilities and Irrigation

Xcel shall coordinate with CDOT and obtain all necessary permits required to perform the relocation work.

Xcel shall coordinate the relocation of Xcel-owned poles with all attached utility owners, including Clearnetworx, Lumen, UPN and Spectrum.

At conflict location 2-E-002, Xcel shall relocate the light pole north of the proposed sidewalk.

At conflict location 2-E-020, Xcel shall adjust pole anchoring to include sidewalk anchor at a minimum of eleven (11) feet over sidewalk at the existing pole.

At conflict location 3-C-022 / 2-E-056, Xcel shall coordinate with Lumen and Clearnetworx regarding the timing and sequencing of work. Following removal of Lumen facilities and transfer of ownership, Xcel shall assume ownership of the existing pole. Xcel shall coordinate with Clearnetworx to avoid disruption to existing attached facilities and ensure proper sequencing of work. Xcel shall then relocate the pole at conflict location 2-E-056 as shown on the plans.

At conflict location 2-E-003, Xcel forces shall remove the light pole.

At conflict location 2-E-022, Xcel forces shall relocate the pull box north of the proposed sidewalk along the existing service alignment. Xcel shall coordinate with Mesa County and the City of Grand Junction for all work associated with the pull box relocation and reconnection of existing service lines.

Timing: The above work shall be completed prior to construction.

2-E-006, 2-E-058: Upon completion of construction in the affected areas, the Contractor shall notify Xcel when facilities are ready for final grade adjustment, and Xcel shall adjust the existing transformer and existing pull box accordingly.

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Utilities and Irrigation

Known irrigation users within the limits of this project are associated with the Grand Valley Irrigation Company (GVIC) and its irrigation laterals, as identified below:

User	Contact	Contact Information
UM 190	Randy McHodgkins, President Randy Cook	970-270-5366 970-462-8229
	Larry Kempton, Vice President	970-250-0908 kemptonair@hotmail.com
UM 180	Dean Hollatz, President	970-245-6845 dhollatz@bresnan.net
UM 170	Dan Tuttle, President of Palace Estates Bryce, Maintenance	970-644-2639 303-993-9044 970-840-8354
UM 165	Andy Maes	970-985-9821
UM 160	Richard Traver (Incorporated)	970-263-4014 Trvr_wstland@hotmail.com
UM 158	Richard Traver (has some general knowledge)	970-263-4014 Trvr_wstland@hotmail.com
UM 148	No Contact Information Richard Traver (is familiar with these structures)	970-263-4014 Trvr_wstland@hotmail.com

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Utilities and Irrigation

All irrigation information included in this specification is subject to change based on the final terms of executed irrigation agreements. Coordination with the irrigation provider, associated irrigation laterals, and users is underway regarding their infrastructure on the project – the Contractor shall coordinate with the Engineer on terms and requirements included as agreements are completed between the City and the applicable irrigation parties.

All Irrigation Facilities (Public or Private)

The existing irrigation system within the project limits is a blended stormwater and irrigation conveyance system with active irrigation infrastructure. All irrigation facilities shown on the plans or encountered during construction shall be assumed active unless confirmed otherwise by the irrigation provider or lateral.

The locations of irrigation facilities shown on the plans were obtained from the best available information. Existing irrigation facilities may have been previously buried or modified and may not be visible during design. The Contractor shall uncover, identify, and verify any irrigation lines or components encountered during construction as necessary to perform the work.

The Contractor shall coordinate construction around any private or public irrigation facilities found in the project limits, including those not otherwise identified. Work that impacts any such facilities shall take place between November 1st and March 31st unless otherwise specified or with written permission from the irrigation provider or lateral. These dates are subject to change per user and location.

The Contractor shall notify the irrigation provider or lateral 7 days prior to any construction activities associated with impacts to the irrigation facilities. Notification of affected users shall be coordinated as directed by the irrigation provider or lateral. For construction activities adjacent to the irrigation facilities but not impacting infrastructure, the Contractor shall notify the irrigation provider or lateral 48 hours in advance. The Contractor shall request notification from the irrigation provider or lateral of the first date of the year that a water call is anticipated.

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Utilities and Irrigation

For construction activities or impacts to irrigation facilities occurring during the April 1st to November 1st irrigation season, the Contractor shall coordinate with the Engineer and the irrigation provider or lateral to minimize impacts to irrigation water delivery. Prior to installing any temporary facilities or implementing measures that alter the existing irrigation system, the Contractor shall notify and obtain approval from the Engineer and the irrigation provider or lateral.

No work or impact to water delivery shall occur until individual irrigation agreements are executed with the associated provider or lateral. The City shall inform the contractor when irrigation agreements have been executed. It is not anticipated for all agreements to be executed at the same time.

All field changes shall be coordinated and approved by the irrigation owner or lateral and the Engineer.

The contractor shall protect all irrigation facilities in place during all construction activities except those affected by the improvements included in these plans. Planned interruptions or modifications to water delivery shall be coordinated with and approved by the Engineer and irrigation provider or lateral.

The contractor shall maintain reasonable access to irrigation infrastructure for the irrigation provider or lateral and affected users unless written permission for temporary access closures is issued by the Engineer following coordination with the irrigation provider or lateral.

Following the completion of adjustments to irrigation facilities, the Contractor shall coordinate and perform a walk-through with the Engineer and irrigation provider or lateral, and affected users as applicable prior to the start of the ditch’s flow season to review the work

UM190
This project includes proposed adjustments to UM190 facilities. This irrigation network is actively used and needs to remain active during irrigation season. All construction shall be performed between November 1st and March 31st. The Contractor shall contact Randy McHodgkins, Randy Cook and Larry Kempton at least 7 days prior to any construction activities associated with impacts to the irrigation facilities.

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Utilities and Irrigation

The Contractor shall coordinate with the City to comply with lateral-specific requirements committed to under the City's construction agreement with the lateral.

UM180
This project includes proposed adjustments to UM180 facilities. This irrigation network is actively used and needs to remain active during irrigation season. All construction shall be performed between November 1st and March 31st. The Contractor shall contact Dean Hollatz at least 7 days prior to any construction activities associated with impacts to the irrigation facilities.

The Contractor shall coordinate with the City to comply with lateral-specific requirements committed to under the City's construction agreement with the lateral.

UM170
This project includes proposed adjustments to UM170 facilities. This irrigation network is actively used and needs to remain active during irrigation season. All construction shall be performed between November 1st and March 31st. The Contractor shall contact Dan Tuttle at least 7 days prior to any construction activities associated with impacts to the irrigation facilities.

The Contractor shall coordinate with the City to comply with lateral-specific requirements committed to under the City's construction agreement with the lateral.

UM165
This project does not include adjustments to UM165 facilities. This irrigation network is actively used and needs to remain active during irrigation season. The Contractor shall take care during construction to not impede the use and function of this lateral.

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Utilities and Irrigation

UM160

This project includes proposed adjustments to UM160 facilities. This irrigation network is actively used and needs to remain active during irrigation season. All construction shall be performed between November 1st and March 31st. The Contractor shall contact Richard Traver at least 7 days prior to any construction activities associated with impacts to the irrigation facilities.

The Contractor shall coordinate with the City to comply with lateral-specific requirements committed to under the City's construction agreement with the lateral.

UM158

This project does not include adjustments to UM158 facilities. This irrigation network is actively used and needs to remain active during irrigation season. The Contractor shall take care during construction to not impede the use and function of this lateral.

UM148

This project does not include adjustments to UM148 facilities. This irrigation network is actively used and needs to remain active during irrigation season. The Contractor shall take care during construction to not impede the use and function of this lateral.