

TECHNICAL SPECIFICATIONS

CITY OF THORNTON Springvale Trail Connection Project No. 20-675A

The latest editions of the 2019 CDOT Standard Specifications for Road and Bridge Construction and Thornton Engineering Construction Standards and Specifications control construction of this project.

The following special provisions supplement or modify the Standard Specifications and take precedence over the Standard Specifications and Plans.

PROJECT SPECIAL PROVISIONS

DIVISION 100 – GENERAL PROVISIONS

REVISION OF SECTION 106 CONTROL OF MATERIAL

REVISION OF SECTION 201 CLEARING AND GRUBBING

REVISION OF SECTION 202 REMOVAL OF STRUCTURES AND OBSTRUCTIONS

REVISION OF SECTION 203 EXCAVATION AND EMBANKMENT

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REVISION OF SECTION 212 SEEDING, FERTILIZER, SOIL CONDITIONER AND SODDING

REVISION OF SECTION 214 PLANTING

REVISION OF SECTION 304 AGGREGATE BASE COURSE

REVISION OF SECTION 403 HOT MIX ASPHALT

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IMPROVEMENTS

REVISION OF DIVISION 100 GENERAL PROVISIONS

Unless otherwise noted, all Division 100 General Provisions are deleted and replaced with the City of Thornton's Contract Documents included in Volume 1.

Any references to Division 100 in Divisions 200 through 700 are removed. The City of Thornton General and Special Provisions shall apply for any removed provisions.

Section 106 as revised herein shall be included in the Contract.

Other General Provisions:

- 1. The City's standard details are referenced on the drawings and utilized for this project. Some of the details have been modified for the specific needs of this project. The Contractor shall not obtain City standard detail from the City's website or other sources and shall only use the standard City details presented on the drawings.**

1
**REVISION OF SECTION 106
CONTROL OF MATERIAL**

Section 106 of the Standard Specifications is hereby replaced with the following:

106.01 Quality Control Testing. The Contractor shall be responsible for Quality Control Testing for this project. The following minimum testing shall be included:

1. Existing Soils:

- 4 Proctor tests for existing soils

2. Concrete Tests for Flatwork:

- One (1) test series shall be taken per 50 cubic yards (or fraction thereof) of the concrete placed per day, or as directed by the Owner.
- Field cured test series: four (4) cylinders, one (1) to be broken at seven (7) days or as directed by the Owner.
- Lab cured test series: four (4) cylinders one (1) to be broken at seven (7) days; two (2) to be broken at 28 days. One (1) to be held for 56 day break should the 28 day breaks fail. Approval based on lab tests verified by field samples if necessary.

2
**REVISION OF SECTION 106
CONTROL OF MATERIAL**

- Determine slump of the concrete sample of each strength test whenever consistency of concrete appears to vary, or when directed by the Infrastructure Engineering Manager, in accordance with AASHTO T119.

- Determine air content of the concrete sample for each strength test

3. Compaction Testing – Aggregate Base Course:

- At least one (1) sample of aggregate base course for each 500 tons of material placed shall be tested to determine gradation and Atterberg limits.
- During placement and compaction, Compaction Curves shall be required for each material used.

4. Compaction Testing - Fill:

- In-place moisture-density / percent relative compaction: 1 per 500 cu yds. or fraction thereof with one additional test required per change in material type being placed with minimum 1 test per lift.

3
**REVISION OF SECTION 106
CONTROL OF MATERIAL**

106.02 Measurement and Payment

The cost of sampling, testing, and corrective action by the Contractor will not be paid for separately but shall be included in the work.

The Pay Item price for Quality Control shall also include any "startup" or incidental costs necessary to provide quality control, including but not limited to any necessary Construction Equipment, offices, buildings, Materials or Equipment, or personnel.

Payments for Quality Control shall be made on a monthly basis in accordance with the following formula:

Contract Amount Completed		Quality Control Amount Paid
25%	=	25%
50%	=	50%
75%	=	75%
100%	=	100%

Payment will be made under:

Pay Item	Pay Unit
Quality Control	Lump Sum

END OF SECTION REVISION

1
**REVISION OF SECTION 201
CLEARING AND GRUBBING**

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

Subsection 201.01 shall include the following:

Any clearing, grubbing, and tree trimming/removal activities that occur between 1 April and 31 August requires a migratory bird nest check by a qualified biologist to make sure no occupied nests are affected by these activities. Work outside of this nesting season can occur without this check. The Contractor shall coordinate this work through the Engineer.

All trees and shrubs adjacent to and within the project limits shall be protected with the exception of those specified within the Plans to be removed.

Removal of small brush and trees with trunk diameter (caliper) less than 6-inches will not be measured and paid for separately but shall be included in the work.

Limits of clearing and grubbing shall be field verified by the Owner after field staking has been completed and prior to clearing and grubbing.

Subsection 201.02 shall include the following:

The Contractor shall make necessary arrangements for obtaining suitable disposal locations. If disposal will be at other than established dump sites, the City may require the Contractor to furnish written permission from the property owner on whose property the materials and debris will be placed.

In subsection 201.02 delete the 3rd, 4th, and 5th paragraphs and replace them with the following:

Surface objects and trees, stumps, roots, and other protruding obstructions not designated to remain shall be cleared and/or grubbed as required, to ensure complete removal; however, nonperishable, non-toxic objects which shall be a minimum of two (2) feet below subgrade may remain when such objects will not impede other subsurface operations.

Except in areas to be excavated, stump holes, and other holes from which obstructions are removed shall be backfilled with suitable material and compacted in accordance with subsection 203.06. Materials and debris shall be disposed of in a manner acceptable to the City.

Burning of any materials shall not be permitted without prior written approval of the City, the County Health Department, and Fire Department. If permitted, perishable material shall be burned under the constant care of the Contractor, at times and in a manner that will not endanger the surrounding vegetation, adjacent property, or objects designated to remain. Burning shall be done in accordance with applicable laws and ordinances.

2
**REVISION OF SECTION 201
CLEARING AND GRUBBING**

In subsection 201.02 delete the 8th paragraph and replace it with the following:

Branches of trees or shrubs shall be removed as directed by the City. Trimming shall be done by skilled workmen and in accordance with good tree pruning practices. Hedges shall be pulled or grubbed in such a manner as to assure complete and permanent removal.

In subsection 201.04 delete the 4th paragraph and replace it with the following:

If approved of by the City prior to the work, clearing and grubbing beyond the limits designated under this item will be paid for as Extra Work in accordance with Section 8 of the City of Thornton's General Condition.

Subsection 201.04 shall include the following:

Payment will be made under:

Pay Item	Pay Unit
Clearing and Grubbing	Lump Sum

END OF SECTION REVISION

1
**REVISION OF SECTION 202
REMOVAL OF STRUCTURES AND OBSTRUCTIONS**

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

In Subsection 202.02 delete the 1st paragraph and replace it with the following:

The Contractor shall raze, remove, and dispose of foundations, signs, structures, fences, pavements, utilities, traffic signal materials, and other obstructions, which are designated for demolition within the project limits, except for utilities and for materials which are to be preserved or salvaged.

Subsection 202.02 shall include the following:

Where portions of structures are to be removed, the remaining portions shall be prepared to fit new construction. The work shall be done in accordance with plan details and in such a manner that materials to be left in place shall be protected from damage. Damage to portions of structures which are to remain in place shall be repaired at the expense of the Responsible Party. Reinforcing steel, projecting from the remaining structure, shall be cleaned and aligned to provide bond with new extension. Dowels shall be securely grouted with City-approved grout. Remaining structures are to be delineated in the as-built drawings.

Storm sewers, culverts, waterlines, and other conduits that are to be removed shall be saw-cut, completely removed, and disposed of off-site. Storm sewers, culverts, waterlines, and other conduits that are to be abandoned in place shall be saw-cut, and completely filled with flash or flow fill. All of the Contractor's costs, for removing and disposing of conduits or abandoning conduit pipes in place shall be included in the bid price for the particular item that requires removal and/or abandonment of structures and obstructions.

Subsection 202.11 shall include the following:

There will be no measurement and payment for saw cutting required for the removal of asphalt and concrete. Saw cutting shall be considered incidental to bid items which require saw cutting.

Removal of concrete flatwork shall include: over excavation; moisture conditioning the over excavated soil; replacing and compacting the over excavated soil, providing suitable material if the over excavated soil is not suitable; disposal of unsuitable material; all in accordance with the soils report to provide a suitable base for fill and/or the pavement section.

2
**REVISION OF SECTION 202
REMOVAL OF STRUCTURES AND OBSTRUCTIONS**

Subsection 202.12 shall include the following:

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

No material or debris shall be disposed of within the project limits without the written permission of the City.

Payment will be made under:

Pay Item	Pay Unit
Removal of Sidewalk (Concrete)	Square Yard
Removal of Concrete Pavement	Square Yard
Removal of Curb Ramp	Square Yard

END OF SECTION REVISION

1
SECTION 203
EXCAVATION AND EMBANKMENT

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

Subsection 203.03 shall include the following:

All fill material should be free of vegetation, brush, sod and other deleterious substances and should not contain rocks, debris or lumps having a diameter of more than 4 inches. A geotechnical engineer should evaluate the suitability of all proposed import fill material for the project prior to placement.

Subsection 203.05(e) shall include the following:

Stripping shall not be completed outside of the limits of construction or limits of disturbance.

In Subsection 203.11 delete the 1st paragraph.

Subsection 203.11 shall include the following:

Earthwork requiring more than one handling will not be measured and paid for separately but shall be considered incidental to the Excavation and Embankment quantities listed in the bid schedule.

2
SECTION 203
EXCAVATION AND EMBANKMENT

In Subsection 203.11 delete subparagraphs (a) and (b) and replace with the following:

Quantities for Unclassified Excavation Complete in Place and Embankment Complete in Place shall not be measured, but shall be the quantities designated in the Contract. The Contractor is responsible for verifying the quantities prior to completing their bid. If the Contractor believes that the quantities of earthwork are different than those presented on the bid schedule, then the Contractor shall adjust their bid prices accordingly.

Stripping will not be measured and paid separately but shall be considered incidental to the bid items for earthwork.

Subsection 203.12 shall include the following:

Disposal of unsuitable material and importing suitable material will not be paid for and shall be considered incidental to the bid item for Unclassified Excavation (Complete In Place). The bid item for Unclassified Excavation (Complete In Place) shall include but is not limited to excavation, haul, disposal of unsuitable material, importing suitable material, moisture conditioning, compaction, water, and all labor, materials, and equipment required to removal and replace unsuitable material.

Payment will be made under:

Pay Item	Pay Unit
Unclassified Excavation (Complete In Place)	Cubic Yard
Potholing	Hour

END OF SECTION REVISION

1
SECTION 207
TOPSOIL

Section 207 of the Standard Specifications is hereby revised for this project as follows:

Subsection 207.01 shall include the following:

Topsoil shall be imported to the site and shall meet the requirements of these specifications. Topsoil shall not be removed and replaced in the temporary construction easements or staging areas.

Subsection 207.02 shall include the following:

The topsoil shall have an acidic reaction of 6.0 to 7.5 pH and shall contain between 1 and 4 percent well composted organic matter. Any organic amendments shall include the following:

An organic product containing a mixture of well-rotted/composted cow or sheep manure and or composted aspen humus or wood residue or approved equal (sphagnum or native mountain peat is not acceptable). Organic product that has been aerobically and naturally processed in such a manner as to maintain a consistent temperature of 140 degrees Fahrenheit 60 degrees Celsius or greater for a period of time that is long enough to accomplish the following specifications:

1. The windrows of composted organic amendment (cow or sheep manure) have to be composted for 70 to 90 days. Certification must be provided to prove the product has gone through this process.
2. Eradicate harmful pathogens including coliform bacteria.
3. Free from noxious weeds or their seeds or any plant, root or seeds that would be toxic or harmful to growth.
4. Create a carbon to nitrogen ratio of no less than 15/1 to 25/1.
5. Contain no solid particle greater than 13 mm ½" in diameter.
6. Have a non-offensive smell similar to fresh turned soil.
7. Contain no significant level of dirt or soil and contain a maximum of 30% composted wood residue (pine or aspen wood) (saw dust is unacceptable).
8. The pH after composting shall be between 5.0 and 7.5 with an organic matter content of not less than 30%.

Soluble salts shall not be greater than 3mmhos/cm.

Topsoil shall contain the following minimum ammonium DTPA (chelate) extractable nutrients (this is the extracting solution used by CSU Soil Testing Laboratory).

Nitrogen	5 ppm Air dried Basis
Phosphorus	5 ppm
Potassium	30 ppm
Iron (Fe)	5 ppm

2
SECTION 207
TOPSOIL

Topsoil shall not include any minerals or elements detrimental to plant growth. Soluble salts measured in saturation extract shall be less than 3mmhos/cm.

Subsection 207.04 is deleted and replaced with the following:

No measurement will be made for any work related to topsoil imported to the site.

Subsection 207.05 is deleted and replaced with the following:

Quantities for Topsoil shall not be measured, but shall be the quantities designated in the Contract and presented in the bid. Only the quantities presented on the bid schedule will be paid.

The addition of manure or soil amendments needed to bring the topsoil into conformance with the specifications will not be measured and paid for separately, but shall be included in the work. Stockpiling of topsoil and handling of topsoil material shall be included in the unit price of the work. Soil Analysis shall not be paid for separately, but shall be included in the cost of the work.

Payment for Topsoil shall include Topsoil imported to the site and subsequently placed upon completed cut and fills slopes. Imported Topsoil shall meet the requirements of this specification. All materials and work require to amend imported Topsoil, if necessary, so that it meets the requirements of Section 207 shall be included in the unit price bid for Topsoil. All work required for Topsoil shall be included in the unit price bid.

Payment will be made under:

Pay Item	Pay Unit
Topsoil	Cubic Yard

END OF SECTION REVISION

1
**REVISION OF SECTION 208
EROSION CONTROL**

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

Subsection 208.01 shall include the following:

The Contractor shall provide routine inspection and maintenance of final erosion control BMPs and temporary BMPs left on-site for one year after final acceptance of the project by the City. This work shall be completed in accordance with the requirements of this section.

After one year, the Contractor shall remove all temporary BMPs. Inspection reports shall be delivered to the City within 48 hours after each inspection. When maintenance is required, the Contractor shall notify the City 48 hours prior to completing maintenance. The Contractor shall anticipate 24 inspections (twice monthly).

Subsection 208.11 shall include the following:

There will be no measurement and payment made for erosion control maintenance before final acceptance of the project.

There will be measurement and payment made for erosion control maintenance after final acceptance of the project under Erosion Control Maintenance (1-Year).

In subsection 208.11 delete the 1st paragraph and replace it with the following:

Erosion Control Management will not be measured and paid for separately but shall be considered incidental to the project regardless of the number of ECIs required. Erosion Control Management shall include, but is not limited to, erosion control inspections, documentation, meeting participation, SWMP Administration, and the preparation of the SWMP notebook.

There will be no separate measurement or payment for maintenance of individual BMPs while under the Erosion Control Maintenance (1-year) pay item. Erosion Control Maintenance includes, but is not limited to, removal of sediment, and adjustment of erosion logs and/or silt fence.

In subsection 208.12 delete the 5th paragraph after the list of pay items.

2
**REVISION OF SECTION 208
EROSION CONTROL**

Subsection 208.12 shall include the following:

Erosion Control Management, Removal and Disposal of Sediment (Equipment), Removal and Disposal of Sediment (Labor), Sweeping and Trash Removal, Stabilized Staging Area, Stockpile Management, Dust Control, Good Housekeeping Practices, and Sediment Trap are required as part of the project ESCP but will not be measured and paid for separately but shall be considered incidental to the project.

Payment will be made under:

Pay Item	Pay Unit
Aggregate Bag	Linear Foot
Concrete Washout Structure	Each
Erosion Log (Type 1) (9 inch)	Linear Foot
Silt Fence	Linear Foot
Storm Drain Inlet Protection (Type 1)	Linear Foot
Vehicle Tracking Pad	Each
Erosion Control Maintenance (1-year)	Lump Sum

END OF SECTION REVISION

1
**REVISION OF SECTION 212
SEEDING, FERTILIZER, SOIL CONDITIONER, AND SODDING**

Section 212 of the Standard Specifications is hereby modified to add the City's specific requirements as follows:

DESCRIPTION

This work shall consist of amending all seed and sodding areas with organic matter, inoculants, and a separate surface application of a biological nutrient.

Protection of existing trees shall be conducted in accordance with the City of Thornton Specification Section 105.6.

Sodding shall be conducted in accordance with the City of Thornton Specification Section 800.

MATERIALS

Biological nutrient (Biosol), all-purpose fertilizer 7-2-3. The biological nutrient shall be: 96% fungal biomass (dry mycelium), 1% water, and 3% potassium-magnesia.

Compost; A-1 organics compost or equal, must be produced at a composting facility meeting EPA 40 CFR 503.13 requirements.

PREPARATION

Existing soils in areas to be seeded shall be ripped and tilled prior to incorporating amendments. Areas with existing grasses and forbs shall be eradicated with applications of a systemic, non-selective herbicide such as glyphosate or approved equal and applied by a licensed applicator prior to ripping and tilling. Minimize tilling of soil within 8 ft of existing trees to avoid damaging root systems.

2
**REVISION OF SECTION 212
SEEDING, FERTILIZER, SOIL CONDITIONER, AND SODDING**

CONSTRUCTION REQUIREMENTS

Apply compost to all areas to be seeded at a rate of 3 cubic yards per 1000 square feet. Compost shall be worked thoroughly and evenly to an 8-inch depth

Apply biological nutrient after seeding and planting and before application of mulch; this includes all sod areas, shrub beds, native seeding, and tree planted areas. No fertilizer shall be applied for wetland seeded areas. Apply at a rate of 1500 lbs per acre to the soil surface; do not work into the soil. No other fertilizer is recommended. Apply prior to placing erosion control blankets.

Subsection 212.02 shall be revised as follows:

1.2 DEFINITIONS

- A. Finish Grade: Elevation of finished surface of planting soil.
- B. Pesticide: A substance or mixture intended for preventing, destroying, repelling, or mitigating a pest. This includes insecticides, miticides, pesticides, fungicides, rodenticides, and molluscicides. It also includes substances or mixtures intended for use as a plant regulator, herbicide, defoliant, or desiccant.
- C. Pests: Living organisms that occur where they are not desired or that cause damage to plants, animals, or people. These include insects, mites, grubs, mollusks (snails and slugs), rodents (gophers, moles, and mice), unwanted plants (weeds), fungi, bacteria, and viruses.
- D. Planting Soil: Standardized topsoil; existing, native surface topsoil; existing, in-place surface soil; imported topsoil; or manufactured topsoil that is modified with soil amendments and perhaps fertilizers to produce a soil mixture best for plant growth.
- E. Subgrade: Surface or elevation of subsoil remaining after excavation is complete, or top surface of a fill or backfill before planting soil is placed.
- F. Subsoil: All soil beneath the topsoil layer of the soil profile, and typified by the lack of organic matter and soil organisms.
- G. Surface Soil: Soil that is present at the top layer of the existing soil profile at the Project site. In undisturbed areas, the surface soil is typically topsoil, but in disturbed areas such as urban environments, the surface soil can be subsoil.
- H. Weeds: Including but not limited to Goathead, Bindweed, Twitch, Dandelion, Jimsonweed, Knapweed, Quackgrass, Horsetail, Morning Glory, Rush Grass, Mustard, Lambsquarter, Chickweed, Cress, Crabgrass, Canadian Thistle, Nutgrass, Poison Oak, Blackberry, Tansy Ragwort, Bermuda Grass, Johnson Grass, Poison Ivy, Nut Sedge, Nimble Weed, Bent Grass, Wild Garlic, Perennial Sorrel, and Broom Grass.

3
REVISION OF SECTION 212
SEEDING, FERTILIZER, SOIL CONDITIONER, AND SODDING

1.3 SUBMITTALS

- A. See Division 01 Section "Submittals" for submittal requirements.
- B. Product Data: For each type of product indicated.
 - 1. Pesticides: Include product label and manufacturer's application instructions specific to this Project.
- C. Qualification Data: For qualified landscape installer.
- D. Product Certificates: For soil amendments and fertilizers, from manufacturer.
- E. Material Test Reports: For existing-in-place surface soil.
 - 1. Soil analysis for each topsoil to be used.
 - 2. Analysis for manufactured topsoil.
 - 3. Analysis for each soil amendment. Compost analysis specific to the sample & dated within 30 days of date of submittal.
 - 4. Analysis for each amended planting soil.
- F. Analysis and standards: Wherever applicable, for non-packaged materials, provide two copies of analysis by recognized laboratory made in accordance with methods established by the Association of Official Agriculture Chemists.
- G. Planting schedule: Submit in writing two copies of proposed planting schedule, indicating dates for topsoil placing, site preparation, pesticide treatments, soil preparation, sodding, seeding, and coordination with plant procurement, planting soil preparation, plant delivery and planting. Schedule all Work during specified planting seasons. Once accepted, revise dates only as approved in writing, after documentation of reasons for delays.
- H. Maintenance Instructions: Recommended procedures for maintenance of turf and dryland grasses during a calendar year. Submit before expiration of required initial maintenance periods.

**REVISION OF SECTION 212
SEEDING, FERTILIZER, SOIL CONDITIONER, AND SODDING**

- I. Contract Closeout Submittals:
 - 1. Operating and Maintenance Data: At completion of work, submit one digital copy and two hard copies to the Project Manager in accordance with Division 01 Section "Contract Closeout". Include directions for irrigation, aeration, mowing, fertilizing and spraying as required for continued and proper maintenance through full growing season and dormant period.

1.4 QUALITY CONTROL

- A. Installer Qualifications: A qualified landscape installer whose work has resulted in successful dryland grass establishment.
 - 1. Professional Membership: Installer shall be a member in good standing of either the Professional Landcare Network or the American Nursery and Landscape Association.
 - 2. Experience: Five years' experience in installation in addition to requirements in Division 01 Section "Quality Control."
 - 3. (Blank)
 - 4. Installer's Field Supervision: Require Installer to maintain an experienced full-time supervisor on Project site when work is in progress.
 - 5. Personnel Certifications: Installers shall have certification the following categories from the Professional Landcare Network:
 - a. Certified Landscape Technician - Exterior, with installation maintenance irrigation specialty area(s), designated CLT-Exterior.
 - 6. Maintenance Proximity: Not more than two hours' normal travel time from Installer's place of business to Project site.
 - 7. Pesticide Applicator: State licensed, commercial.
- B. Soil-Testing Laboratory Qualifications: An independent laboratory or university laboratory, recognized by the State Department of Agriculture, with the experience and capability to conduct the testing indicated and that specializes in types of tests to be performed.
- C. Preinstallation Conference: Conduct conference at Project site to coordinate the process with other trades, to coordinate equipment movement within planting areas and to avoid soil compaction, to review proposed methods of installation, performance criteria, and maintenance procedures. Review underground utility location maps and plans. This meeting shall be coordinated by the Contractor, and comply with requirements in Division 1.

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REVISION OF SECTION 212
SEEDING, FERTILIZER, SOIL CONDITIONER, AND SODDING

- D. Standards: All materials and methods used during this portion of the work shall meet or exceed applicable federal, state, county, and local laws and regulations. All sod shall be free from insects and disease. Species shall be true to their scientific name as specified.
- E. Materials: The Contractor shall submit to the Project Manager for approval a complete list of all materials to be used during this portion of the work prior to delivery of any materials to the site. Include complete data on source, amount and quality. This submittal shall in no way be construed as permitting substitution for specific items described on the plans or in these specifications unless approved in writing by the Project Manager.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Fertilizer: Deliver inorganic or chemical fertilizer to site in original unopened container bearing manufacturer's guaranteed chemical analysis, name, trade name, trademark, warranty and conformance to state law.
- B. Bulk Materials:
 - 1. Do not dump or store bulk materials near structures, utilities, walkways and pavements, or on existing turf areas or plants.
 - 2. 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.
 - 3. Accompany each delivery of bulk fertilizers and soil amendments with appropriate certificates.
 - 4. Fertilizer: Deliver inorganic or chemical fertilizer to site in original unopened container bearing manufacturer's guaranteed chemical analysis, name, trade name, trademark and conformance to state law, and bearing name and warranty of producer.
- C. Material will be inspected upon arrival at project site. Project Manager will reject any opened or unacceptable materials as described above.
- D. Immediately remove unacceptable material from job site.

**REVISION OF SECTION 212
SEEDING, FERTILIZER, SOIL CONDITIONER, AND SODDING**

1.6 PROJECT/SITE CONDITIONS

- A. Work scheduling: Proceed with and complete landscape work as rapidly as portions of the site become available, working within the specified planting season and approved schedule.
- B. Vehicular accessibility on site shall be as directed by Project Manager. 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 City.
- C. Schedule work for periods of favorable weather. Do not install sod on saturated or frozen soil. The Project Manager reserves the right to deny sod installation on days that are deemed to be unfavorable for installation.
- D. Existing conditions:
 - 1. Utilities: Determine location of underground utilities. Perform work in a manner to avoid possible damage. Hand excavate, as required.
 - 2. Excavation: Maintain grade stakes set by others until removal is mutually agreed upon by parties concerned. When conditions detrimental to plant growth are encountered, such as rubble fill, adverse drainage conditions, noxious materials or obstructions, notify Project Manager before planting.
 - 3. If weeds are present on site, treat with pesticide prior to preparing soil for installing seed as specified in this or other Sections of the City of Thornton Native Seed Guidelines.
- E. Coordination:
 - 1. Coordinate with construction of utilities on site. Do not begin soil amendment until underground work is completed in the area.
 - 2. Coordinate with Contractor(s) approved schedule. Limit construction access to areas where soil amendment has been placed if placement is completed more than 3 days prior to commencement of landscaping in the area. Limit fine grading to areas that can be prepared for planting within twenty four (24) hours after fine grading.
 - 3. Coordinate with Contractors work requiring access to site over landscape areas.
 - 4. Coordinate with installation of underground irrigation system.

1.7 WARRANTY

- A. Follow City of Thornton Native Seed Guidelines

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**REVISION OF SECTION 212
SEEDING, FERTILIZER, SOIL CONDITIONER, AND SODDING**

PART 2 – PRODUCTS

2.1 MATERIALS

- A. Topsoil: See Section "Topsoil".
- B. As recommended by testing lab based on soil sample results.
- C. Water: Contractor to utilize the existing irrigation system and or quick coupler(s) when available. If irrigation or quick coupler(s) are not available then the contractor is responsible for watering. Refer to Division 31 Section "Watering". Water shall be free of substances that may be harmful to sod growth. Hoses and other watering equipment necessary to water the sod to be furnished by Contractor.

2.2 PESTICIDES

- A. General: Pesticide, registered and approved by EPA, acceptable to authorities having jurisdiction, and of type recommended by manufacturer for each specific problem and as required for Project conditions and application. Do not use restricted pesticides unless authorized in writing by Project Manager and authorities having jurisdiction.
 - 1. Pre-Emergent Pesticide (Selective and Non-Selective): Use only with approval by Project Manager. Effective for controlling the germination or growth of weeds within planted areas at the soil level directly below the mulch layer.
 - 2. Post-Emergent Pesticide "Round-up" by Monsanto, or approved equal.

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**REVISION OF SECTION 212
SEEDING, FERTILIZER, SOIL CONDITIONER, AND SODDING**

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas to be planted for compliance with requirements and other conditions affecting performance.
 - 1. Verify that finish grades are consistent with the slopes and grades indicated on the Contract Drawings. Verify grades are in conformance with Division 31 Section "Earth Moving".
 - 2. 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 a planting area.
 - 3. Do not mix or place soils and soil amendments in frozen, wet, or muddy conditions.
 - 4. Suspend soil spreading, grading, and tilling operations during periods of excessive soil moisture until the moisture content reaches acceptable levels to attain the required results.
 - 5. Uniformly moisten excessively dry soil that is not workable and which is too dusty.
- B. Proceed with installation only after unsatisfactory conditions have been corrected and approved by the Project Manager.
- C. If contamination by foreign or deleterious material or liquid is present in soil within a planting area, remove the soil and contamination as directed by Engineer and replace with new planting soil.
- D. Acceptance: Beginning of installation means acceptance of existing conditions by the Contractor.

3.2 PREPARATION

- A. Work notification: Notify the Project Manager at least seven (7) working days prior to start of sodding operations.
- B. Limit subgrade preparation to areas that can be planted within twenty four (24) hours.
- C. Newly Graded Subgrades: Prepare soil as required by Division 32 Section "Soil Preparation".

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- D. Unchanged Subgrades: If seed is to be planted in areas unaltered or undisturbed by excavating, grading, or surface-soil stripping operations, prepare surface soil as follows:
 - 1. Remove existing grass, vegetation, and turf. Do not mix into surface soil.
 - 2. Loosen surface soil to a depth of at least 8 inches. Apply soil amendments and fertilizers according to planting soil mix proportions and mix thoroughly into top six inches (6") of soil. Till soil to a homogeneous mixture of fine texture.
 - 3. Remove stones larger than one-half ($\frac{1}{2}$ ") inch in any dimension and sticks, roots, trash, and other extraneous matter.
 - 4. Legally dispose of waste material, including grass, vegetation, and turf, off City property.
- E. Moisten prepared area before planting if soil is dry. Water thoroughly and allow surface to dry before planting. Do not create muddy soil.
- F. Verify that all areas are graded to drain at a minimum of two percent (2%) or as indicated on the Contract Drawings. Verify that subsurface drainage system and drain inlets if any, are operative.
- G. Verify that irrigation system is operable and provides adequate coverage prior to planting.
- H. Adjustment: Adjust irrigation heads to proper watering height according to depth of seed material but lower than compacted blade height to enable lawn mowers to cut grass freely without damage to the sprinkler system.
- I. When completed, the soil shall be firmed by float dragging, followed by steel raking, to provide for the proper subgrade. The bed shall be totally free from rock or clay clods over one-half inch ($\frac{1}{2}$ ") inch in diameter and be approved by the city.
- J. Repair: Re-establish grade and specified conditions to damaged sod areas prior to placing sod.

3.3 INSTALLATION

- A. Use City of Thornton Native Seed Guidelines

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3.4 TREE AND PLANT PROTECTION

- A. Refer to City of Thornton Specification Section 105.6 for tree and plant protection requirements.
- B. Protect existing utilities, paving and other facilities from damage caused by sodding operations, Contractor shall repair any damage at no additional cost to the City.
- C. Restrict vehicular and pedestrian traffic from sodded areas until grass is established. Erect signs and barriers as required or directed by the Project Manager at no additional cost to the City.
- D. Locate, protect and maintain the irrigation system during sodding operations. Repair irrigation system components damaged during sodding operations shall be replaced or repaired to current City irrigation standards at Contractor's expense.
- E. 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.

3.5 MAINTENANCE

- A. Use City of Thornton Native Seed Guidelines

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Subsection 212.06 Native Seeding shall include Pawnee Buttes Native Prairie Seed Mix as follows:

A. Seed Mix

1. The specific seed mix shall be Pawnee Buttes Native Prairie Mix or approved equal consisting of the following:

Blue Grama	29%
Buffalograss	25%
Sideoats Grama	20%
Western Wheatgrass	20%
Green Neddlegrass	5%
Sand Dropseed	1%

Seeding rate to be 30 lbs. PLS/acre

Prairie Coneflower	33.33%
Blue Flax	66.66%

Seeding rate to be 3 lbs. PLS/acre

B. Seedbed Preparation

1. The seedbed shall be free of debris, including weeds, plant matter, rocks, clods and other impervious material over 1" in diameter. Seedbed shall be smooth and free of large clumps, fluffy yet firm, moist but not wet. When walking across the bed, a shoe imprint in the soil should not be deeper than 1". Before incorporation of amendment, COT will inspect the seedbed.
2. Preparing the seedbed should be timed with appropriate planting dates to conserve soil moisture and prevent wind and water erosion. Seeding of irrigated grasses can occur any time during the growing season, but for best and quickest results, warm season grasses should be seeded in May and no later than July. Dryland seeding of cool season non-irrigated grasses should occur between November 15th & April 15th. Dryland seeding of non-irrigated warm season grasses should occur between March 15th & June 15th.
3. Soil amendment: Biosol and humate product to be broadcast on planted seed bed.
 - 600 lbs/Ac humate broadcast and 1200 lbs/Ac (if high organic results after soil test) to 1800 lbs/Ac (if low organic results after soil test) Biosol Mix 7-2-3 topically applied after drilling (Available at Rocky Mountain Bio Products, Denver, 303-696-8964)
 - OR 600 lbs/Ac humate broadcast and Biosol at 1500 lbs/Ac topically applied after drilling (Available at Pawnee Buttes Seed Company, Greeley, 970-356-7002 or 800-782-5947) or approved equal.

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C. Planting

1. Before planting, COT will approve incorporation of amendment into seedbed.
2. Provide the seed mix for City approval. In most cases, minimum seeding rate is 30-60 lbs PLS/acre with the rate doubled for broadcast seeding. Seed tags, certified copy of seed analysis and load tickets for soil amendment are required.
3. Seeding shall be done immediately after soil preparation to discourage weed competition. Seed shall be evenly distributed over amended ground on a still day into a slightly moist seedbed, using an approved grass drill with double disc openers, packer wheels and (fluffy) seed boxes as appropriate. As appropriate, drill equal quantity of seed ¼" deep in two directions at right angles to each other. Hand-broadcast methods shall be at double the seeding rate and shall be 'raked in' or otherwise covered with soil to a depth of ¼". Hydraulic seeding can only be used in areas not accessible for machine methods; seed and mulch shall not be applied in the same operation.
4. All seeded areas shall be hydro-mulched with wood (not paper) fiber in a separate application after drilling. Mix water, 2000 lbs/Ac of mat fiber mulch and 100 lbs/Ac of tackifier, or at manufacturer's recommended rates, whichever is greater. Hydraulic mulching shall not be performed in the presence of free surface water. In areas not able to be hydromulched, cover all seeded area with 100% biodegradable straw blankets with biodegradable blanket pins.
5. If irrigated, within 12 hours of seeding, water seeded area frequently and lightly. Water enough to keep the soil moist, but not so heavily as to cause soil washing and loss of the grass seed.
6. Seeded slopes approved as 3:1 shall be covered with biodegradable erosion control seed blankets.
7. Germination during the growing season is expected within 3-6 weeks. Spot regrading, reseeding and mulching shall immediately be required for areas of little or no germination and to repair areas damaged by erosion, wind, vandalism, fire or other causes.
8. Flower/forbe seed may be added to mixes where grasses will not be mowed, but shall not substitute for quantities of seed. Species that readily reseed themselves seem to work best.

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D. Establishment

1. Keeping the seed moist is the key to germination and initial growth. New seeding will need water within the first seven days. High seeding rates, shallow drilling of no greater than ½" and narrow (2-4") seeder row spacing have proven to be critical in obtaining rapid establishment.
2. If irrigated, design the irrigation system for 'head to head' coverage, using rotor and spray heads with matched precipitation rates.
 - Establishment irrigation means applying water a minimum 2 times/day until seed germinates to the three leaf stage. After the three leaf stage and until the grass is 3-4" tall, water 2 times/day with a total 3/10" water/day.
 - Cool season grasses need ¾ to 1" of water per week, between March 1st to November 1st. Warm season grasses grow and need water from May 15th to September 15th.
 - After the first mowing and for the next two growing seasons (April-October), water 1" every two weeks. Adjust establishment irrigation inches by natural precipitation amounts.
3. The establishment period for irrigated seed can be a minimum of two growing seasons. After two seasons, water is applied as desired to create a particular landscape style, generally 1" water/month. Establishment of non-irrigated seed can take three to five growing seasons or more.
4. Initial Acceptance of seeding will require meeting the Stormwater Discharge Permit obligations. This work also includes meeting obligations and requirements of the Corps of Engineers Nationwide Permit for wetland mitigation seeded area coverage, as applicable.
5. Trees and shrubs in natural seed areas (chosen from Ultra-low Water Demand List) require irrigation zoned separately from seeded areas.

E. Maintenance | Weed Control

1. Mowing
 - Timely mowing operations are the industry standard used to manage weed control without chemicals. No mowing for the first six weeks after seeds sprout; mow weeds before annual seed set. It may be necessary to mow during the first growing season, depending on when grass was seeded. It is usually necessary to mow in the second year, depending on timing and amount of additional required reseeding.
 - Dryland areas should be mowed when weeds reach 8" or every 45 days. Irrigated areas should be mowed every three weeks or when grass reaches a maximum height of 12".
 - Mow grass with a flail type mower, not a sickle mower, to a height of 6". The goal of mowing is to knock down the weeds and just skim the tops of the new grass. Remove weeds by hand over 6-8" tall that are not controlled by mowing, generally once a month

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2. Chemical Treatment
 - For perennial weed control, use spot chemical spraying or hand weeding after grass plants are up and fairly mature, minimum past the three to five leaf stage. Remove weeds by hand over 6-8" tall that are not controlled by chemical treatment, generally once a month.
 - Apply herbicide only with the written approval of the City and as recommended by a professional applicator. Apply a selective pre- and post-germination herbicide that is labeled for use with the species listed on the seed mix, to control weeds for the maintenance period before Initial Acceptance and during the warranty period between Initial and Final Acceptance.
 - The use of Journey selective, pre-emergent herbicide or equivalent shall be required in areas infested with Cheatgrass (*Bromus tectorum*) and other grassy weeds.
 - Herbicide application for control of annual winter growing weeds usually occurs near August 15th and for perennial weeds near October 15th.
3. Litter and Debris Removal: Remove all litter and debris larger than two inches in size, such as rocks, plastic, paper, metal and glass and dispose of off site.

F. City Acceptance Criteria for Seeded Area

1. Initial Acceptance may occur when the City has received and approved all product certifications and quantities and given written acknowledgement that the designated area has been prepared, seeded, mulched and maintained to meet the specification requirements.
 - Contractor shall maintain seeded area until Initial Acceptance.
 - Regrading, reseeding, remulching and weed control is required until Initial Acceptance for areas of little or no seed germination and to repair areas damaged by erosion, wind, vandalism, fire or other causes.
 - Initial Acceptance of seeded area shall meet Stormwater Discharge Permit obligations.
2. Final Acceptance may occur one year after Initial Acceptance when the stand of grass displays uniform coverage at minimum three to five leaf stage of the seed mix planted (minimum 80% healthy grass coverage over any 10 square foot area and bare spots not exceeding 10" by 10"), with all species of the mix being well represented, minimal weeds present and the area free of surface irregularities (no rills & gullies), as determined by the City.
 - Final Acceptance of seeded area shall meet Stormwater Discharge Permit obligations and obligations and requirements of the Corps of Engineers Nationwide Permit for seeded area coverage, as applicable.
 - Any areas that do not comply with Final Acceptance criteria shall be reseeded by the Contractor in accordance with these specifications, using specified materials and methods.
 - Hydromulch may not be required in reseeded areas.

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METHOD OF MEASUREMENT

The quantity of native seeding will not be measured but shall be the quantity designated in the Contract, except that measurements will be made for revisions requested by the Engineer, or for discrepancies of plus or minus five percent of the total quantity designated in the Contract. The quantity of native seeding shall include soil preparation, fertilizer, soil conditioner, and seed applied, completed, and accepted.

The Contractor shall furnish the Owner with seed certifications and analysis, fertilizer analysis, delivery tickets, and bag weight tickets prior to placing any seed or fertilizer.

Any seed or fertilizer placed by the Contractor without the Owner's approval will not be paid for.

Tree Protection shall be measured by the linear foot of tree protection fencing installed and accepted by the City.

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BASIS OF PAYMENT

Payment for Tree Protection shall be by the linear foot of tree protection fencing installed and accepted by the City.

The accepted quantity of native seeding 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
Tree Protection	Linear Foot
Native Seed Mix	Square Foot
Sod	Square Foot

Payment shall be made at the applicable contract unit price for Bid Item and shall include full compensation for all labor, equipment, tools, and materials necessary to complete the work.

Soil preparation, water, seed, fertilizer, hydro mulch, and soil conditioner, incorporated into the seeding sodding or soil conditioning will not be paid for separately but shall be included in the work.

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

END OF SECTION REVISION

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Subsection 214.04 shall be revised to include the following:

LANDSCAPE MAINTENANCE

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

- A. Contract Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes requirements for furnishing of all supervision, labor, materials, equipment and transportation required to maintain the landscape areas called for under this contract for the time-period specified. The work includes but is not limited to: weed control, re-sodding, mowing, watering of plant material and pruning, irrigation system repair and maintenance, and coordination with City staff.

1.3 SUBMITTALS

- A. Maintenance Reports: Submit detailed maintenance quarterly reports and schedules for the Maintenance and Guarantee Period for review and approval by the City, the City Forester, and the City Naturalist.
- B. Material List: Submit a detailed list of materials to be used for seeding, fertilization, pesticide, plant health, and mulching.
- C. Equipment List: Submit a detailed list of equipment and chemical controls to be used for all landscape maintenance purposes.
- D. Work Examples: Submit list of three (3) projects completed in the last two (2) years of similar complexity to this project. Include the name and location of the project, the City's name, email address, and telephone number, and the name of the project landscape architect, email address, and telephone number. Include certifications held by contractor and subcontractor employees who will oversee the work during the Maintenance Period.

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1.4 CONTRACTUAL REQUIREMENTS

- A. Maintenance Period: The Maintenance Period shall commence from the date of Initial Acceptance on an existing Contract, or a start date established by a separate maintenance contract in accordance with these Specifications. The Maintenance Period shall continue for one (1) year.
- B. 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 City. Areas outside defined areas, as illustrated on the Contract Drawings, will be maintained by the City.
- C. Performance of Work: The Contractor's equipment shall be accepted by the City prior to the commencement of the Maintenance Period. If the City finds any items unacceptable, the Contractor shall make the revisions noted by the City at no cost to the City.
- D. Scheduling / Progress Reports:
 - 1. Scheduling: Prior to the beginning of the Maintenance Period, the Contractor shall submit for approval by the City 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 City'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 City is notified in advance of any changes.
 - 2. Notification: The Contractor shall be required to notify the City a minimum forty-eight (48) hours in advance of all major work so the City 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 City shall have the right to require the Contractor to reschedule any such work until such time that the City is available. The above provision applies only to work which could be perceived as normal or regularly scheduled maintenance, emergency repairs do not apply.
 - 3. Progress Reports: The Contractor shall submit quarterly progress reports. The written progress reports shall be sent to the City, prior to quarterly on-site meetings, outlining the work completed, damage incurred, and problems encountered. Progress reports shall contain digital photo documentation of work.
 - 4. Site Meetings: The Contractor shall meet, on site, with the City and City staff on a quarterly basis to review the project status.
 - 5. After Hours Contact: The Contractor shall provide one (1) after hours contact, and telephone number.
- E. Maintenance Coordination: The Contractor shall coordinate maintenance operations and activities with the City.
- F. Failure to Perform: In the event that, in the City's opinion, action has not been taken on the part of the Contractor to properly maintain the project, the City may take whatever action deemed necessary to affect such repairs and any costs incurred will be deducted from the Contract amount.

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- G. Licenses, Taxes, and Insurance:
1. 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).
 2. Taxes: City is tax exempt.
 3. Insurance: The Contractor shall maintain all insurance policies in accordance with the General Contract Conditions of the contract through the entire term of the Maintenance and Guarantee period.
- H. Payment Schedule: Payments shall be made as indicated in Measurement and Payment section.

PART 2 – PRODUCTS

2.1 NOT USED

PART 3 – EXECUTION

3.1 NATIVE SEEDING AREAS

- A. Refer to Rev Section 212 “Native Seeding” for satisfactory establishment criteria
- B. The Maintenance Period shall begin at Substantial Completion and continue for the period specified until Acceptance of native seed areas. Acceptance of native seeded areas will not be given until the maintenance period has ended and the City is satisfied with the germination, coverage, and the vegetation is in a healthy and vigorous growing condition in accordance with the Specifications. During this time, the Contractor shall be responsible for watering, mowing, spraying, weeding, fertilizing and all related work as necessary to ensure that seeded areas are in a vigorous growing condition. The Contractor shall provide all supervision, labor, material and equipment to develop and maintain seeded areas.
- C. The Contractor shall protect the site during the Maintenance Period. All damage that occurs to the seeded areas during the Maintenance period, including vandalism, shall be repaired by the Contractor with approved materials at no additional cost to the City.
- D. Maintain and establish native seed areas by weeding, mowing, trimming, replanting, watering and performing other operations as required to establish healthy, viable vegetation. Roll, regrade, and replant bare or eroded areas and re-mulch to produce healthy vegetation. Provide materials and installation the same as those used in the original installation.
1. Fill in as necessary soil subsidence that may occur because of settling, damage, or other processes.
 2. In areas where mulch has been disturbed by wind or maintenance operations, add new mulch and anchor as required to prevent displacement.
 3. 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.

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- E. All watering shall be done in such a way as to encourage establishment, deep root growth and drought tolerance.
1. Watering: Utilize irrigation system to water native seeded areas to obtain establishment of an acceptable grass stand, and to supplement natural moisture levels during dry periods.
 - a. Schedule watering to prevent wilting, puddling, erosion, and displacement of seed or mulch. Lay out temporary watering system to avoid walking over muddy or newly planted areas. Obtain approval of City of irrigation system and schedule proposed for use.
 - b. Water native grasses with fine spray at a minimum rate of one-half inch (1/2") per week for six (6) weeks after planting unless rainfall precipitation is adequate.
 - c. Do not over-water in a manner which kills drought-tolerant components of the seed mix.
- F. Mowing:
1. Year One: Mowing of native grasses in the first year after seeding shall be avoided unless approved by the City. If mowing in the first year is allowed, then mow only in the early growing season or late in the fall to allow grass seeds to drop. Mowing shall be at a height of six inches (6") to eight inches (8").
- G. Weed Control:
1. Weed control shall be done for the duration of the Maintenance Period and until Final Acceptance per the Establishment section in Rev Section 212 "Native Seeding". Weed control shall be completed by one (1) or more of the following methods approved by the City:
 - a. Mowing: Mowing of undesirable species shall be done per the approval of the City as a weed control method. Undesirable species shall not be allowed to seed on the site. Avoid distribution of weed seeds by catching all clippings, bagging clippings and removing them from the site. Existing grass stands to remain shall not be mowed until late fall or early spring to encourage seed drop.
 - b. Chemical Control: If necessary, apply to perennial and annual weeds by a licensed applicator trained in plant identification at no additional cost to the City. Obtain the City'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 or the City Naturalist.
 - c. Spot Application Chemical Control: Apply pesticide by hand applicator directly to invasive annual and perennial weeds. Allow a minimum two (2) weeks between application and any seeding activities or depending on the product used.

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- H. Reseeding:
 - 1. Evaluate native grass areas quarterly during the Maintenance Period to review the germination and coverage. Use the following criteria:
 - a. Reseed all areas that meet the following conditions:
 - 1 Areas of bare or dead grass greater than twenty-four inches (24") by twenty-four inches (24") square
 - 2 Areas of weed density are per the Acceptance section in Division 32 Section Native Seeding".
 - 2. Reseed unacceptable areas as defined above. Reseeding, soil preparation and mulching shall comply with Rev Section 212 "Native Seeding" and Section "Soil Preparation". If approved, seed mixes may be revised (% of species) to better suit site conditions. If requested by the City, the mix shall be revised at no additional cost to the City. Where drill seeding is not feasible, hand broadcast seed and rake into the soil to achieve 1/4- to 1/2-inch coverage of soil. The seed application rate shall be doubled in all areas where it is mechanically broadcast and quadrupled in areas requiring hand broad casting. Hydroseeding is not allowed.
- I. 3. Timing of reseeding shall be as specified herein. With written approval of the City, the Contractor may reseed later.

3.2 TREE, SHRUB, AND PLANT CARE

- A. Pruning: Refer to Rev Section 212 "Trees, Shrubs, and Groundcovers" for maintenance requirements.
- B. All plants are the responsibility of the Contractor during the Maintenance Period.
- C. Replacement of Plants: Remove and replace dead, diseased, dying or damaged plants (including material damaged by vehicles or vandalism) within fourteen (14) calendar days of notification by the City or the City Forester. Upon the City's written approval, the Contractor may replace rejected plants later, provided that the Contractor removes all rejected plants within fourteen (14) calendar days of the notice to replace such plants. If the rejected plants are not removed within fourteen (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 Maintenance Period shall be replaced by the Contractor at the Contractor's expense.

3.3 IRRIGATION SYSTEM AND WATER MANAGEMENT

- A. Contractor shall check all irrigation systems for proper operation after each mowing, 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.
- B. Contractor is responsible for following all Thornton Water restrictions and establishment rules for new landscapes.

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- C. Contractor shall be responsible for providing an Establishment Watering Schedule, Transition Watering Schedule and a Maintenance Watering Schedule to the City, the Operation Supervisor and the RainBird Field Representative (when applicable).
1. 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.
 2. Prior to any plant material being installed all schedules shall be provided to the City and the Operations Supervisor.
 3. The water schedule templates are available from City of Thornton Water Conservation and the City. See Appendix
 4. Contractor shall make any modifications to the programming as requested by the City.
 5. Initial Irrigation (Days 1-21):
 - a. Plants shall be adequately watered for the first twenty-one (21) days after installation or until seeds have germinated and emerged or sod has become firmly rooted.
 - 1 Exact timing of irrigation cycles will depend on weather conditions, soil conditions, and speed of emergence of grass seed.
 - 2 Short, frequent irrigation cycles shall be used.
 - 3 Split cycles or the 'cycle and soak' feature must be employed to reduce erosion or run off in seeded areas.
 - 4 Do not exceed three inches (3") of total water per week.
 - 5 Coordinate the irrigation system schedule and programming with the City, and City staff. City may choose to involve other parties from the City or irrigation equipment manufacturer.
 - 6 Do not over-water native seeded areas in a manner which adversely impacts germination and growth of any components of the seed mix.
 - 7 Contractor shall submit a meter reading before and after establishment to verify water use.
 6. Transition Irrigation (Days 21-60):
 - a. 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.
 - b. Allow the surface soils to dry slightly between watering to encourage deeper rooting.
 - c. Watering shall be done utilizing historic evapotranspiration rates for the current watering month(s).
 - d. Do not over-water native seeded areas in a manner which adversely impacts germination and growth of any components of the seed mix.
 7. Maintenance Irrigation (Days 61 – End of Maintenance Period):
 - a. Irrigate as needed to maintain an optimum stand of turf while minimizing water use.
 - b. Irrigation frequency shall be adjusted monthly, at a minimum, based on historical evapotranspiration rates and plant (turf and tree) water requirements.
 - c. It is the responsibility of the Contractor to coordinate with City, Operations Staff, and local Rainmaster Field Representative the programming of irrigation controllers, to properly irrigate plant materials and turfgrass.
 - d. Do not over-water native seeded areas in a manner which adversely impacts germination and growth of any components of the seed mix.
- D. Time of Irrigation: Watering shall occur during the approved Thornton Water allowed water window. Coordinate times with the City.

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- E. Winterization of Irrigation System: Under the Maintenance Period, the Contractor shall be responsible for winterizing the irrigation system and pumps, if applicable, for the full Maintenance Period.
1. Remove water from system by use of compressed air.
 2. Remove water from drip lines by opening flushing plugs.
 3. Submit a meter reading after winterization of the system has occurred to Parks Water Conservation.
 4. Winterization shall occur no later than October 15th unless a variance has been granted from the City.
- F. Spring Start-Up: The Contractor shall be responsible for starting up the irrigation system in the spring (April 15).
1. Fully activate the system including controller start-up, in order to demonstrate that it is in full working order.
 - a. Any repairs that are needed as a result of improper winterization shall be corrected by the Contractor at no additional cost to the City.
 2. Correct all deficiencies and make any adjustments to ensure proper system function.
 3. Submit a meter reading prior to spring start-up to the City.
- G. 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 Maintenance Period, and the Contractor agrees to make any adjustments or repair any defects occurring within the Maintenance Period within 7 calendar days of notification by the City.
1. The Contractor shall replace any materials with manufacturer's defects at no additional cost to City.
 2. Replacement of any equipment shall match that installed and designed on the irrigation plans unless a variance is approved in writing from the City.
 3. Problems resulting in leakage or water waste shall be repaired within 12 hours of notification.
 4. If an emergency repair is necessary, the Contractor is responsible for shutting down valves on the mainline.
 - a. If the Contractor neglects to perform these duties within the specified time, the City may make such repairs at the Contractor's expense.
 - b. 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.
- H. Any settling of irrigation trenches/backfill material during the Maintenance Period shall be repaired by the Contractor's at no additional cost to the City.
- I. Contract documents shall govern irrigation replacement during Maintenance Period the same as new work.
- J. Replacements are to be made at no additional cost to the City.

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

3.4 INSPECTION AND ACCEPTANCE

- A. Formal Inspections: The project will be inspected during the Maintenance and Guarantee Period at the following points:
 - 1. Quarterly Inspections
 - 2. Contract Completion Inspection
- B. 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.
- C. Contract Completion Inspection and Acceptance: The Contractor must give seven (7) days of notice to the City 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 City. When all work has been completed per the Contract Documents, the Contractor may request in writing from the City Final Acceptance.

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METHOD OF MEASUREMENT

Subsection 214.05 shall include the following:

The quantity of planting to be measured will be the number of plants, of the types and sizes designated in the Contract, that are actually planted and accepted.

Measurement will be based on the percentage complete for the lump sum contract amount for Landscape Maintenance.

BASIS OF PAYMENT

Subsection 214.06 shall include the following:

The accepted quantities of planting 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 the total cost of the item will be made at the completion of planting. Cost of the performance bond shall be included in the cost of the plant items.

Payment will be made at the lump sum contract price, and shall include required materials, transportation, equipment, labor, disposing, hauling off, watering, dust control, equipment inspections, fertilizing, weeding, winterization, reseeding, weed control, plant materials and replacement, disking, raking, spreading, fine grading, mowing, furnishing and installation of seeds, mulch installation and maintenance of temporary protection by fencing or other means, coordination with the City, and quarterly logs as required in accordance with the Contract Drawings and Specifications.

Payment will be made under:

Pay Item	Pay Unit
Landscape Maintenance (1-Year)	Lump Sum

END OF SECTION REVISION

1
**REVISION OF SECTION 304
AGGREGATE BASE COURSE**

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

Delete Subsection 304.02 and replace it with the following:

Aggregate base course materials shall be from a source approved by the City. The Contract shall provide a submittal including all material properties for review and approval prior to construction.

Materials for the base course shall be Aggregate Base Course (Class 6) as shown in subsection 703.03 – Aggregate for Bases.

The Aggregate Base Course (Class 6) shall meet the gradation requirements and have a resistance value of at least 78 when tested by the Hveem Stabilometer method.

Acceptance will be based on random samples taken from each lift.

Subsection 304.04 shall include the following:

Materials shall be placed on an approved subgrade which has been proof-rolled within the past 24 hours and found to be stable and non-yielding. Should weather conditions change, such as freezing, precipitation, etc., aggregate base materials shall not be placed until the subgrade is reapproved.

Delete Subsection 304.07 and replace it with the following:

Measurement shall be based on tons taken from the weight tickets provided to the City at time of delivery to the site.

Delete Subsection 304.08 and replace it with the following:

The accepted quantities of aggregate base course, of the class specified, will be paid for at the contract price bid per ton placed and compacted, as shown in the bid schedule.

Payment will be made under:

Pay Item	Pay Unit
Aggregate Base Course (Class 6)	Ton

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

Commercial mineral fillers, when used, shall be considered incidental to the bid item for Aggregate Base Course

END OF SECTION REVISION

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					
		SX(75)	S(75)	SX(50)	S(50)		Patching
Air Voids, percent at: N (design)	CPL 5115	3.5 – 4.5	3.5 – 4.5	3.5 – 4.5	3.5 – 4.5		3.5 – 4.5
Lab Compaction (Revolutions): N (design)	CPL 5115	75	75	50	50		75
Stability, minimum	CPL 5106	30	30	30	30		30
Aggregate Retained on the 4.75 mm (No. 4) Sieve for S, SX and SG, and on the 2.36mm (No. 8) Sieve for ST and SF with at least 2 Mechanically Induced fractured faces, % minimum*	CP 45	60	60	60	60		60
Accelerated Moisture Susceptibility Tensile Strength Ratio (Lottman), minimum	CPL 5109 Method B	80	80	80	80		80
Minimum Dry Split Tensile Strength, kPa (psi)	CPL 5109 Method B	205 (30)	205 (30)	205 (30)	205 (30)		205 (30)
Grade of Asphalt Cement, Top Layer		PG 76-28		PG 58-28			PG 76-28
Grade of Asphalt Cement, Layers below Top			PG 64-22		PG 58-28		PG 64-22
Voids in the Mineral Aggregate (VMA) % minimum	CP 48	See Table 403-2	See Table 403-2	See Table 403-2	See Table 403-2		See Table 403-2
Voids Filled with Asphalt (VFA), %	AI MS-2	65-75	65-75	65-75	65-75		65-75
Dust to Asphalt Ratio Fine Gradation Coarse Gradation	CP 50	0.6 – 1.2 0.8 – 1.6	0.6 – 1.2 0.8 – 1.6	0.6 – 1.2 0.8 – 1.6	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.

2
REVISION OF SECTION 403
HOT MIX ASPHALT

Hot mix asphalt may contain up to 20% of recycled asphalt pavement. Recycled asphalt pavement shall meet requirements of Section 504.2 of the City of Thornton's Standards and Specifications.

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

Table 403-2

Nominal Maximum Size*, mm (inches)	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.

Hot mix asphalt for patching shall conform to the gradation requirements for Hot Mix Asphalt Grading SX for the top lift and Grading S for the bottom lifts.

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

Acceptance samples shall be taken at the location specified in Method A of CP 41.

3
**REVISION OF SECTION 403
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.

At locations where new Hot Mix Asphalt is to abut existing asphalt, saw cut the existing pavement a minimum of 1 foot back from the existing edge with a neat line and remove pavement. A tack coat shall be applied along the vertical abutting face of the existing asphalt.

A tack coat shall be applied to all milled surfaces prior to applying an asphalt pavement overlay. A tack coat shall be applied along the vertical face of all curb and gutter prior to asphalt paving.

At patches, compaction shall initially be completed along the outside edges of the patch, and then proceed from the low side to the high side of the patch. The new asphalt patch shall have a minimum compacted thickness equal to the existing pavement thickness and be level and well matched to the existing pavement.

The Contractor shall commence placing hot mix asphalt within 3 working days after the street has been milled, and within 1 working day after the subgrade has been proof rolled, weather permitting.

The Contractor shall collect the scale ticket on each load when it is delivered to the project site, and ensure that the information required in by the City is shown on each ticket.

The scale tickets shall be available on site for City to inspect.

Each day the Contractor shall provide to the Engineer envelopes which contain the previous day's signed tickets and the following:

1. On each envelope: Project number, date of paving, type of material, daily total and cumulative total.
2. One of the following:
 - a) Two adding machine tape tabulations of the weight tickets with corresponding totals run and signed by different persons,
 - b) One signed adding machine tape tabulation of the weight tickets that has been checked and signed by a second person,
 - c) Signed check tape of computer scale tickets that have a cumulative total. These scale tickets must be consecutive and without voids adjustments.
3. A listing of any overweight loads on the envelope, including ticket numbers and amount over legal limit.
4. A comparison of the actual yield for each day's placement to the theoretical yield. Theoretical yield shall be based on the actual area paved, the planned thickness, and the actual density of the mixture being placed. Any variance greater than +2.5% shall be indicated on the envelope and a written explanation included.

4
**REVISION OF SECTION 403
HOT MIX ASPHALT**

The Contractor shall provide a vehicle identification sheet that contains the following information for each vehicle:

- 1) Vehicle number
- 2) Length
- 3) Tare weight
- 4) Number of axles
- 5) Distance between extreme axles
- 6) All other information required to determine legal weight.
- 7) Legal weight limit.

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 square yard installed and accepted by the City.

The structural section for Hot Mix Asphalt (Patching) shall match the section shown on the plans, or match the existing section, whichever is greater.

Payment will be made under:

Pay Item	Pay Unit
Hot Mix Asphalt (Patching)	Square Yard

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.

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.

Sawcutting and removal of existing asphalt pavement will not be measured or paid separately, but shall be incidental to Hot Mix Asphalt (Patching).

Asphalt cement used in Hot Mix Asphalt (Patching) will not be measured and paid for separately, but shall be included in the work.

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

Tack Coat will not be paid for separately but shall be considered incidental to the project.

END OF SECTION REVISION

1
**REVISION OF SECTION 412
PORTLAND CEMENT CONCRETE PAVEMENT**

Section 412 of the Standard Specifications is hereby revised as follows:

Subsection 412.03 is revised to include the following:

Fibrous Reinforcing

- A. Fibrous reinforcing shall be used in Portland cement concrete used for curb, gutter, sidewalks, bikeways, and trails.
- B. The following shall be submitted to the Engineer.
 - 1. One copy of manufacturer's printed product data, clearly marked, indicating proposed fibrous concrete reinforcement materials. Printed data should state 1.5 lbs. of fiber to be added to each cubic yard of each type of concrete.
 - 2. One copy of manufacturer's printed batching and mixing instructions.
 - 3. One copy of a certificate prepared by the concrete supplier stating that the approved fibrous concrete reinforcement materials at the rate of 1.5 pounds per cubic yard were added to each batch of concrete delivered to the project site. Each certificate shall be accompanied by one (1) copy of each batch delivery ticket indicating amount of fibrous concrete reinforcement material added to each batch of concrete.
- C. Fibrous concrete reinforcement shall consist of:
 - 1. One hundred (100) percent virgin polypropylene fibrillated fibers specifically manufactured for use as concrete reinforcement, containing no reprocessed olefin materials. Fibrous concrete reinforcement shall be as manufactured by Fibermesh Company, 4019 Industry Drive, Chattanooga, Tennessee 37416, or approved equivalent. Substitutions may be considered at the discretion of the Engineer.

Subsection 412.17 shall include the following:

Roadway smoothness incentive for Portland Cement Concrete Pavement is not included in this project.

END OF SECTION REVISION

1
**REVISION OF SECTION 607
FENCES**

Section 607 of the Standard Specifications is hereby revised for this project as follows:

Subsection 607.04 shall include the following:

All labor, materials, and equipment required to complete the work of Fence (Plastic) will not be measured separately but shall be included in the work. Fence (Plastic) is noted as Construction Fence on the plans.

Subsection 607.05 shall include the following:

Payment for Fence (Plastic) shall include, but not be limited to, all labor, materials, and equipment required to complete the work.

Payment will be made under:

Pay Item	Pay Unit
Fence (Plastic)	Linear Foot

END OF SECTION REVISION

1
**REVISION OF SECTION 608
SIDEWALKS AND BIKEWAYS**

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

Delete subsection 608.01 and replace it with the following:

This work consists of the construction of bituminous or concrete sidewalks, bikeways, and curb ramps in accordance with these specifications and in conformity with the lines and grades shown on the Plans or established.

Concrete trail with curb section as shown on the Plans shall be poured monolithically and will be paid under pay item Concrete Bikeway.

Delete subsection 608.02 and replace it with the following:

Materials shall meet the requirements specified in the following subsections:

Joint Fillers	705.01
Aggregate for Bases	703.03
Bed Course Materials	703.07

Concrete for sidewalks and curb ramps shall be CDOT class D and conform to the following minimum requirements:

Required Field Compressive Strength	4500 psi at 28 days
Nominal Sized Course Aggregate	3/4 –inches
Maximum Slump	4-inches
Air Content Range	5% to 8%
Water Cement Ratio	0.45

Concrete shall be mixed with Fibermesh reinforcing strands (or approved equal), at the rate of 1.5 pounds per cubic yard. Mixing, placing and finishing shall be performed according to manufacturer's recommendations and Section 412 of the Project Specifications.

Sidewalk ramp detectable warning field shall be cast-in-place red East Jordan Iron Works or approved equal.

Subsection 608.03(c) shall include the following:

Prior to placing concrete for sidewalks, bikeways and curb ramps, a minimum of 4 inches of class VI aggregate base course shall be placed in accordance with Section 304 of the Project Specifications.

2
**REVISION OF SECTION 608
SIDEWALKS AND BIKEWAYS**

Subsection 608.03(f) shall include the following:

Concrete shall not be left exposed for more than 2 hours between the time finishing is completed and commencement of curing treatment unless approved by the Owner.

It shall be the Contractor's responsibility to protect the concrete from the elements, vandalism, and physical damage. Any concrete showing any signs of exposure to precipitation, flowing water or freezing, or showing any signs of physical damage shall be removed and replaced by the Contractor at his expense.

Sections of concrete sidewalks, and curb and gutters which develop random cracking shall be removed and replaced, or repaired in a satisfactory manner approved by the Owner, at the Contractor's expense.

Subsection 608.05 shall include the following:

Detectable warnings will not be measured and paid separately, but shall be included in the work. Materials, equipment and labor required to construct detectable warnings will not be measured and paid for separately but shall be included in the work.

3
**REVISION OF SECTION 608
SIDEWALKS AND BIKEWAYS**

Subsection 608.06 shall include the following:

Payment will be made under:

Pay Item	Pay Unit
Concrete Bikeway	Square Yard
Concrete Curb Ramp (6 Inch Thick)	Square Yard

Joints of all types will not be measured and paid for separately but shall be included in the work.

Aggregate base course will be measured and paid for in accordance with Section 304.

Fibrous concrete reinforcement material will not be measured and paid for separately but shall be included in the work.

Detectable warnings shall be included in the curb ramp pay item and not measured separately. All materials, equipment, work for detectable warnings will not be measured and paid for separately but shall be included in the work.

Concrete curb adjacent to concrete trail as shown on the Plans will not be measured and paid for separately but shall be included in pay item Concrete Bikeway.

END OF SECTION REVISION

1
**REVISION OF SECTION 609
CURB AND GUTTER**

Section 609 of the Standard Specifications is hereby revised as follows:

Delete subsection 609.02 and replace it with the following:

For this project, sidewalks adjacent to curb and gutter shall be poured monolithically with curb and gutter and shall be paid for under the pay item Curb, Gutter and Sidewalk Type 1 (Section 1)(Monolithic). Refer to section 608 for specifications on sidewalk construction.

Except as provided below the materials used shall meet the requirements of the following subsections:

Bed Course Material	703.07
Joint Filler	705.01
Reinforcing Steel	709.01

Concrete for curb and gutter shall conform to the following minimum requirements:

Required Field Compressive Strength	4500 psi at 28 days
Nominal Sized Course Aggregate	3/4 –inches
Maximum Slump	4-inches
Air Content Range	5% to 8%
Water Cement Ratio	0.45

Concrete shall be mixed with Fibermesh reinforcing strands (or approved equal), at the rate of 1.5 pounds per cubic yard. Mixing, placing and finishing shall be performed according to manufacturer's recommendations.

Subsection 609.03(f) is revised to include the following:

Concrete shall not be left exposed for more than 2 hours between the time finishing is completed and commencement of curing treatment unless approved by the Owner.

It shall be the CONTRACTOR's responsibility to protect the concrete from the elements, vandalism, and physical damage. Any concrete showing any signs of exposure to precipitation, flowing water or freezing, or showing any signs of physical damage, shall be removed and replaced by the CONTRACTOR at his expense.

2
**REVISION OF SECTION 609
CURB AND GUTTER**

Subsection 609.06 shall include the following:

Curb, Gutter and Sidewalk Type 1 (Section I) (Monolithic) shall be measured per linear foot along the face of the curb.

Subsection 609.07 shall include the following:

Curb, Gutter and Sidewalk Type 1 (Section I) (Monolithic) shall be paid per linear foot along the face of the curb.

Fiber mesh will not be measured and paid separately but shall be included in the work.

Aggregate base course will be measured and paid for in accordance with Section 304.

Payment will be made under:

Pay Item	Pay Unit
Curb,Gutter and Sidewalk Type 1 (Section I) (Monolithic)	Linear Foot

END OF SECTION REVISION

1
**REVISION OF SECTION 614
TRAFFIC CONTROL DEVICES**

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

In subsection 614.13 delete the 4th Paragraph and replace it with the following:

Ground signs will be measured by the number of signs installed and accepted by the City. Concrete footing (if necessary), sign posts, hardware, mounting and backing angles, will not be measured separately. Sign Panel will be measured by the square foot installed and accepted by the City.

Subsection 614.14 shall include the following:

Payment for Sign Panel and Ground Sign shall include, but not be limited to, all labor, materials, and equipment required to complete the work.

Payment will be made under:

Pay Item	Pay Unit
Sign Panel (Class I)	Square Foot
Ground Sign (New)	Each

END OF SECTION REVISION

1
**REVISION OF SECTION 625
CONSTRUCTION SURVEYING**

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

Subsection 625.11 shall include the following:

All survey records generated shall be the property of the City of Thornton.

Subsection 625.13 shall include the following:

Before granting Initial Acceptance, the following items shall be completed, reviewed and approved by the Engineer:

1. Verification that all Monuments and Stakes have been reset in accordance with sub-section 625.08
2. All Survey Records in accordance with sub-section 625.11

Payment will be made under:

Pay Item	Pay Unit
Construction Surveying	Lump Sum

END OF SECTION REVISION

1
REVISION OF SECTION 626
MOBILIZATION

Delete Section 626 of the Standard Specifications. Use the applicable sections of the City of Thornton, Contract Documents included herein.

MEASUREMENT AND PAYMENT

Measurement and payment shall be made in accordance with Section 22 (MOBILIZATION) of the City of Thornton's Special Conditions.

Payment will be made under:

Pay Item	Pay Unit
Mobilization	Lump Sum

END OF SECTION REVISION