

17.0 LANDSCAPING

This Section 17 includes the requirements for the Landscaping Work for the US 550/160 Connection South Design Build Project (Project). This Work shall be completed in accordance with the Contract Documents.

17.1 Administrative Requirements

17.1.1. Standards

The Contractor shall design and construct the Project in accordance with the requirements of the standards referenced in Book 3. The Contractor shall use the latest adopted edition at the time of the Proposal Due Date.

17.2 Design Requirements

17.2.1. Submittals

All submittals shall be prepared, Reviewed, and submitted in accordance with the requirements set forth in Book 2, Section 3.

17.2.2. Landscape Plan

The Contractor shall prepare and submit a Landscape plan for Acceptance by CDOT. The Landscape plan shall be required for any area of Work where construction disturbance occurs, including permanent Right-of-Way (ROW), temporary Easements, staging, haul road, locations of fill/borrow, temporary fills, access locations or other areas that are disturbed as part of the Work. The re-vegetation of the Farmington Hill area shall be included in the Work and in the Landscape plan.

The Landscape plan shall include:

1. Identification of the existing vegetation locations in all areas that may be potentially disturbed within temporary Easements as part of the Work. This shall include species, location, condition, size, health, and a recommendation for remaining undisturbed, pruning, removal, or replacement in conformance with Book 2, Section 8.
2. Identification of areas adjacent to existing wetlands, trees, and significant vegetation.
3. Identification of removals, clearing and grubbing, and selective thinning areas in the areas between the limits of construction and the ROW.
4. Locations, mitigations, removals, and replacements of trees, shrubs, and landscapes impacted by the Work.
5. The locations of protected areas. The Contractor shall protect and maintain all existing vegetation in the Project, except for the vegetation that must be removed to accommodate construction of the Project. The Contractor shall identify access roads, temporary fills, and any haul roads. The Contractor shall conduct a Site walkthrough to identify areas to be protected to accommodate temporary access features. All construction operations shall be performed in such a manner to avoid these protected areas.
6. Areas to be final-seeded including the seeding mix consistent with the requirements of CDOT, Region 5.

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7. Xeriscaping at the proposed roundabout. The plan shall include all the plant materials and ground covers. For planting materials, the Contractor shall consider the surrounding environment and include drought resistant plant materials and seeding mix.
8. Tree installation at each of the wildlife underpasses. The plan shall include a minimum of 6 evergreen trees Pinyon pine (*Pinus edulus*) or Juniper (*Juniperus spp*): per side (3 per wingwall), each a minimum of 4 feet in height.
9. A schedule of when Work shall take place, per CDOT *Standard Specifications for Road and Bridge Construction (CDOT Standard Specifications)*, Sections 212 and 214.
10. A watering schedule listing the Days chosen to complete the required watering.
11. Drawings and a design intent narrative.
12. An Integrated Noxious Weed Management Plan (INWMP). The Contractor shall use industry standard protocol for weed management, as well as the requirements outlined in Book 2, Section 5.
13. If there any haul roads or temporary fills within Gulch A or Gulch B, the plan shall include a restoration plan for the temporary construction impacts and shall meet the requirements of Book 2, Section 11.

The Landscape plan shall be completed and sealed by a Landscape Architect licensed in the State of Colorado.

A field review or detailed aerial photo survey shall be conducted prior to starting any Landscape Work and shall be submitted with the Landscape plan to CDOT for Acceptance.

When the Landscape plan is Accepted by CDOT and prior to the start of all construction Activities, the Contractor shall designate and clearly tag all existing plants that will remain undisturbed, pruned, or removed, as identified in the Landscape plan.

Upon completion of the designation and tagging activities, the Contractor shall conduct an inspection of the existing Landscape with CDOT prior to the start of construction. The Contractor shall install protection and finish pruning in accordance with the Accepted Landscape plan and address any issues identified during the inspection. Removals may take place over the life of the Project.

17.2.3. Clearing and Work Area Limits Identification and Protection

The Contractor shall prepare a tree removal plan. The plan shall detail the Contractor's methods for complying with the requirements of Book 2, Section 5. This plan shall be submitted for Approval by CDOT prior to Earthwork Notice to Proceed (ENTP). The plans shall clearly delineate the clearing and grubbing Work limits and the trees that will be removed to construct the Project. In addition to these prescribed areas, the Contractor shall identify trees to be removed or protected within the limits of their access roads, temporary fills, and any haul roads. Upon Approval of the tree removal plan, the Contractor shall conduct a site walkthrough with CDOT to verify tree removal limits. After the Site walk-through, the Contractor shall install temporary orange fencing in these Work areas to identify the tree removal or protection boundaries.

The Contractor shall tag the trees adjacent to the existing landowner boundaries, as well as trees that CDOT desires to remain, including those in temporary Easements for protection that are to remain in place. The Contractor shall review Book 2, Section 8, for unique conditions associated with each property acquisition identified. The Contractor shall use all appropriate care to avoid damage or removal of the tagged trees. The Contractor shall contact CDOT before removing a tagged tree. Tagged trees that are damaged shall be replaced in-kind at the Contractor's expense. Trees that are damaged and assessed as

salvageable shall be promptly repaired, pruned, wrapped, and protected from further damage at the Contractor's expense.

17.2.4. Protected Areas

The Contractor shall install temporary fencing for the protection of all existing vegetation that is designated to remain undisturbed and any additional areas defined in Book 2, Section 5. After installation of the fence, the Contractor shall request a field Inspection from CDOT prior to proceeding with the Work.

Fencing shall be placed at the drip line for trees. Construction Activities, such as earth disturbance, storage, staging, or parking inside the drip line shall be prohibited. No chemicals shall be applied or used around or near these areas that would be detrimental to vegetation health.

The Contractor shall immediately report damage to any tree within the Work area designated to remain undisturbed to CDOT for assessment of the damage and survivability. Trees that are damaged shall be replaced at the Contractor's expense if CDOT's, at their sole discretion, determines the tree(s) will not survive.

17.2.5. Trees and Shrubs

17.2.5.1 Trees and Shrubs Removal

Tree stumps within the Roadway prism or within 10 feet of the edges of Roadway pavements shall be completely removed and disposed of off Site. All other tree stumps within the Project area shall be ground to 3 feet below finished grade.

All trees or shrubs removed from the Project shall become the property of the Contractor and shall be completely disposed of off Site by the Contractor.

17.2.5.2 Pruning

The Contractor, if needed, shall have all root and branch pruning that interfere with the Work completed by a licensed and certified tree surgeon. All Work shall be in accordance with American National Standard Institute (ANSI) A300.

17.2.5.2.1 Root Pruning

Tree roots 2 inches or greater in diameter shall not be removed. The Contractor shall not prune roots at a depth greater than the excavation.

17.2.5.2.2 Branch Pruning

The Contractor may prune branches that will interfere with the Work per the Approved Landscape plan and according to Section 240 – *Protection of Migratory Birds, Biological Work Performed by the Contractor's Biologist* of the CDOT *Standard Specifications*.

The Contractor shall remove weak or dead branches on trees that are to remain within the ROW.

17.2.5.3 Planting Locations

Any trees and shrubs impacted within temporary Easements shall be replaced. The replacement trees and shrubs shall be placed in the same area or in same general vicinity. In addition, Book 2, Section 8, identifies additional locations for tree and shrub replacement and protection.

17.2.6. Replacement Plant Material

Replaced Materials shall comply with Section 214 of CDOT's *Standard Specifications* and be equal or better to the existing Materials in type and function. Planting requirements shall meet the criteria listed below.

The Contractor shall provide the minimum sizes to be planted or provided as part of the Work:

1. Native evergreen trees - Either Pinyon pine (*Pinus edulus*)
or Juniper (*Juniperus spp*): 4 feet in height
2. Shrubs:
 - A. Native deciduous shrubs: 5 gallon
 - B. Native evergreen shrubs: 5 gallon
 - C. Native ornamental grasses: 1 gallon

17.2.7. Staking and Watering

New replacement trees shall be guyed in accordance with M-Standard Plans M-214-1 and Section 214 of the CDOT *Standard Specifications*. Trees shall be staked for two growing seasons. All guying material shall be removed by the Contractor at completion of the Landscape Establishment Period, defined in Section 17.2.10.3.

The Contractor shall water new and protected trees on the Project until the Project has reached the Landscape Establishment Period. The Contractor shall water the plant Material per Section 214 of the CDOT *Standard Specifications*.

17.2.8. Topsoil

The existing topsoil should be stripped and stored separately for use on the Project to the extent practical.

All topsoil, either imported or salvaged on Site, shall be treated with an herbicide for noxious weeds identified in the INWMP prior to final seeding.

17.2.9. Seeding

All disturbed areas that are not surfaced, shall be re-vegetated to replicate or enhance native vegetative communities.

Re-vegetation species that attract wildlife to the Roadside area shall not be used.

All areas to be seeded shall be accessible to maintenance activities by CDOT.

Seeding shall follow Section 212 of the CDOT *Standard Specifications* and Book 2, Section 5. Seeding of areas shall be completed in conjunction with erosion control requirements, final Roadside cut/fill slopes and as required in Book 2, Section 5.

If any detention facilities are incorporated into the Project, the slopes shall be planted with an Approved seed mix.

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Placement of soil conditioner, topsoil, seeding, mulching (weed free), and mulch tackifier (or soil retention blanket) shall not be completed in a single operation, but shall be completed immediately following each area that is to final grade, per CDOT *Standard Specifications*, Sections 208, 212, and 213.

Fertilizer shall not be used adjacent to wetlands and waterways.

The Contractor shall place native seed, mulch (weed free), and mulch tackifier after each construction phase and prior to any winter shutdown Work.

The following seed mix, or equivalent, shall be used on the project:

Table 17-1 Seed Mix

COMMON NAME	BOTANICAL NAME	LBS. PLS PER ACRE
Oats	<i>Avina sativa</i>	2.5
Western wheatgrass	<i>Pascopyrum smithii</i> Arriba	4.3
Indian ricegrass	<i>Achnatherum hymenoides</i> Nezpar	3.2
Slender wheatgrass	<i>Elymus trachycaulus</i> San Luis	3.1
James' galleta	<i>Pleuraphis jamesii</i> Viva	3.7
Blue grama	<i>Bouteloua gracilis</i> Hachita	0.8
Mountain brome	<i>Bromus marginatus</i> Bromar	5.4
Western yarrow	<i>Achillea millefolium</i> var. <i>occidentalis</i> VNS	0.1
Rocky Mountain penstemon	<i>Penstemon strictus</i> VNS	0.2
Purple verbena	<i>Verbena stricta</i> VNS	0.3
TOTAL		25.7

17.2.10. Landscaping Inspection, Establishment, Acceptance, and Warranty Period

17.2.10.1 Interim Landscape Inspections

The Contractor's Environmental Compliance Manager (ECM) shall conduct inspections at completion of the following Activities. The Work shall meet the requirements of the Contract Documents prior to proceeding to the next Activity:

1. Completion of the subgrade preparation.
2. Completion of finished grade preparation.

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3. Layout of trees.
4. Layout of all plant materials.
5. Completion of seeding operations.

Nonconforming Work shall be replaced or repaired promptly by the Contractor at its own expense. When damage endangers public safety or traffic, remedial action shall be taken immediately to ensure safety and prevent further disruption of traffic.

17.2.10.2 Substantial Landscape Completion

Substantial Landscape Completion is defined as when all seeding, trees, or plant materials have been planted and are completed in compliance with the requirements of the Contract Documents. Trees and plants shall be healthy and in flourishing condition and be free of dying branches and branch tips; and shall bear foliage of normal density, size, and color.

Prior to Substantial Landscape Completion, a Landscape Inspection shall be held with CDOT to determine Acceptance of trees, plant Material and seeding areas. Upon Acceptance, CDOT will issue a Notice of Substantial Landscape Completion.

17.2.10.3 Landscape Establishment

The Landscape Establishment Period will commence at Project Final Acceptance, which will be contingent upon receipt of a written Notice of Substantial Landscape Completion from CDOT in accordance with the requirements of Section 214 of the CDOT *Standard Specifications for Road and Bridge Construction* and in this Section 17.

All Landscape installations shall be completely maintained by the Contractor during the Landscape Establishment Period. The Contractor shall submit a detailed Landscape maintenance plan in accordance with the requirements of Section 214 of the CDOT *Standard Specifications for Road and Bridge Construction* and prior to requesting Project Final Acceptance. CDOT will Inspect the Landscape installations on at least a monthly basis to determine the Acceptability of the maintenance Work. Nonconforming maintenance will be brought up to Acceptable levels within 5 Days of receipt of notice of maintenance deficiencies.

17.2.10.4 Final Landscape Acceptance

Upon completion of the Landscape Establishment Period, at the Contractor's request, CDOT will Inspect the Landscaping to determine compliance to the requirements of the Contract Documents. All Landscape installations shall be fully established, weed-free, clean, smooth, properly graded, and without tree or plant mortality in order to be Accepted by CDOT.

The Contractor shall schedule a final Landscape Inspection and Verification walkthrough after this walkthrough, the Contractor shall submit a letter requesting Final Landscape Acceptance from CDOT. The Landscape Establishment Period and Contractor maintenance will terminate after CDOT Acceptance is reached. Should CDOT identify any areas of Nonconforming Work, the Contractor shall correct the deficiencies and extend the Landscape Establishment Period for a minimum of one additional growing season at no additional cost to the Project. If Final Landscape Acceptance occurs in the fall, the Contractor shall continue to maintain the Landscaped area until the following spring. Any dead trees, plant material, or seeding areas shall be replaced or repaired at no additional cost to the Project.

The Contractor shall provide Landscape As-Constructed Documents completed by a Landscape Architect licensed in the State of Colorado.

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At the request of the Contractor, a final field review of the Landscaping shall be conducted to ensure compliance with the Contract Documents. The results of the Landscape final field review of the Project re-vegetation shall be submitted showing both the conditions of all landscape items.

The Contractor shall provide accurately detailed As-Constructed Documents of the constructed Landscape plan in format compatible with Bentley InRoads/Microstation SELECT Series 2 and a non-editable format, such as Adobe .PDF, at the same scale as the design plans within 90 Days after installation is complete and before Notice of Substantial Landscape Completion is issued.

Provision of the Landscape As-Constructed Documents is a condition for Final Landscape Acceptance and release of Retainage. The Contractor shall provide finalized As-Constructed Documents to CDOT at the time of Final Landscape Acceptance.

17.2.10.5 Landscape Warranty Period

All trees, shrubs, and ground covers, including seeding, shall be completely Warranted by the Contractor for 1-year from the date of Final Landscape Acceptance. Any plant Material deemed deficient following this 1-year Warranty period, shall be replaced in kind by the Contractor at no additional cost to the Project, and shall be Warranted for 1 additional year by the Contractor. Any additional 1-year Warranty period beyond the initial 1-year Warranty period will be considered an extended Warranty period. Another Inspection will be conducted at the request of the Contractor at the end of the extended Warranty period to determine Acceptance or rejection.

If access to a completed Landscaped area is required by the Contractor after Final Landscape Acceptance, Landscape Materials will be considered existing and shall be protected in accordance with the requirements of the Contract Documents.

17.3 Deliverables

The Contractor shall submit the following to CDOT for Review, Acceptance, or Approval:

Table 17-2 Deliverables

Deliverable	Review Acceptance or Approval	Schedule
Landscape Plan	Acceptance	As part of Final RFC Documents submittal
Tree Removal Plan	Approval	Prior to ENTP
Landscape Maintenance Plan	Acceptance	Prior to the Notice of Substantial Landscape Completion
Landscape As-Constructed Documents	Acceptance	90 Days post installation
Letter requesting Acceptance	Acceptance	After Final Landscape Inspection

*If the Contractor elects to utilize Earthwork NTP (ENTP), the deliverables identified for ENTP shall be submitted to CDOT for Review, Acceptance, or Approval prior to CDOT issuing ENTP. If the Contractor elects not to use ENTP, those deliverables identified shall be submitted to CDOT for Review, Acceptance, or Approval prior to CDOT issuing Second Notice to Proceed (NTP2).