
17.0 Landscaping

17.1 Design Requirements

17.1.1 Landscape Plan

The Contractor shall prepare a Landscape Plan for all plant material in all disturbed areas on the Project. The Landscape Plan shall address both temporary and permanent work. The Landscape Plan shall include the areas to be final seeded, rocked, and hard surfaced. The Landscape Plan shall also include the locations, mitigations, removals, and replacements of Project-impacted trees, shrubs, landscapes and irrigation.

A Final Landscape Plan is required where landscape planting or mitigation planting will occur. The Final Landscape Plan shall be submitted to CDOT, CDOT Landscape Architect, and the City of Pueblo for Acceptance prior to landscaping. Landscaping shall also meet the Project Aesthetic Design Guidelines in Book 4 – Contract Documents.

An interim and final stabilization plan shall be required for any area of the work where new construction disturbance occurs, and shall be developed in conjunction with erosion control requirements as a Best Management Practice in Book 2, Section 5 - Environmental.

Landscape design and re-vegetation (stabilization) plans shall include, but not limited to, the mitigation measures as described and as listed below:

1. Cut and fill slopes shall be minimized and the cut line blended into the existing terrain. Maximum soil slope steepness shall be 3H:1V.
2. Permanent and temporary stabilization for each construction phase.
3. Areas to be permanently stabilized after completion shall follow the requirements of the 2011 CDOT Standard Specifications for Road and Bridge Construction, Sections 101, 107, and 208, 213, and 620 Water Quality Control, 213 Mulching specifications, and other referenced material.
4. Disturbed areas where work has halted shall follow the requirements of the 2011 CDOT Standard Specifications for Road and Bridge Construction, Sections 101, 107, and 208, 213, and 620 Water Quality Control, and other referenced material.
5. Removal of adjacent roadside vegetation shall be minimized where possible
6. Amend embankment to prepare topsoil with compost/bionutrients. Temporary erosion control and sediment control BMP's shall be maintained until the requirements of Book 2, Section 5 – Environmental are satisfied.

17.2 Construction Requirements

17.2.1 Temporary Seeding and Stabilization

Disturbed areas where work has halted shall follow the requirements of the 2011 CDOT Standard Specifications for Road and Bridge Construction, Sections 101, 107, and 208, 213 and 620 - Water Quality Control, and other referenced material.

All temporary disturbed areas not within the work area ~~will~~shall be returned to preconstruction elevation and contours and reseeded with the CDOT supplied seed mix design.

The Contractor shall control noxious weeds, if present prior to disturbance, as needed throughout construction and until CDPS-SCP permit inactivation.

17.2.2 Clearing and Work Area Limits Identification and Protection

The Contractor shall delineate the clearing and work limits for Acceptance by the CDOT (see Book 2, Section 5 – Environmental, Migratory Birds for bird nesting survey requirements). Existing vegetation and or sensitive environments to remain shall be identified and protected. BMP's shall be used to prevent degradation of habitats adjacent to construction area. The CDOT Project Manager will flag those trees adjacent to the boundary that are to remain in place. If trees, shrubs and willows are within the Contractor delineated clearing and work limits the following requirements will apply:

1. The Contractor shall use all appropriate care to avoid damage or removal of the flagged trees. Trees that are damaged shall be replaced 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.
2. Any native tree removed with a diameter of 2 inches or greater will be replaced in-kind at a 1:1 ratio in the same work area. The diameter of a tree is the measured diameter 2-foot up the tree from the ground surface.
3. Shrubs and willows removed shall be replaced with live willow cuttings collected from nearby stands. Willow cuttings will be placed on 2 foot centers.
4. All planted trees and shrubs located in planting areas as shown in the Plans shall be protected with geotextile fabric and wood chip mulch. Trees will not be accepted if the ball of earth surrounding the roots is cracked or broken during delivery and planting.
5. The Contractor shall repair or replace in-kind all landscape material and vegetation on private property which is disturbed by the Work. Replaced materials shall be equal or better to the existing materials in size, type and condition.

17.2.3 Removal of Trees and Shrubs

Tree stumps within the roadway prism or within the clear zone shall be completely removed and disposed of off the Project site. All other tree stumps within the Project shall be ground 3 feet below natural ground or proposed grade, whichever is lower in elevation.

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

17.2.4 Tree and Shrub Transplanting

The Contractor shall not transplant or use non-native trees or shrubs.

17.2.5 Pruning

The Contractor shall have all root and branch pruning completed by a licensed and certified tree surgeon. All work shall be in accordance with American National Standard Institute – ANSI A300-1995, Section 5.3.3.2.

Root Pruning

Tree roots 2 inches or greater in diameter shall not be removed, unless they interfere with the work. Extensive root pruning may require tree replacement as directed by the CDOT.

Roots below the excavation depth for the work shall not be pruned.

Branch Pruning

The Contractor may prune branches that will interfere with the Work.

17.2.6 Staking and Watering

New and transplanted trees shall be staked. Stakes and guying shall comply with the CDOT Standard Plans and Specifications.

The Contractor shall water new and transplanted trees on the Project ~~as required by the Contract~~ as often as necessary until the roots are established.

The Contractor shall report any tree damage to CDOT for assessment of damages. Trees that are damaged and do not survive shall be replaced at the Contractor's expense.

17.2.7 Topsoil

The Contractor shall prepare topsoil with organic amendments at a rate of 43 cubic yards/acre, as described in subsection 212.02 (b) of the 2011 CDOT Standard Specifications for Road and Bridge Construction. The prepared topsoil shall be spread over all disturbed areas with a minimum thickness of 4 inches. The prepared topsoil shall not include any minerals or elements detrimental to plant growth. All rocks and debris larger than 4 inches in diameter that are visible after the topsoil is prepared and spread shall be removed and disposed of in an appropriate manner off the project site.

17.2.8 Permanent Native Seeding

Placement of soil conditioning and fertilizer, seeding and mulching shall not be done in a single operation, and shall be completed within 48 hours following each construction phase or prior to any winter shutdown work. All seeding requirements in the Approved project SWMP shall also be followed. Fertilizer shall not be used adjacent to wetlands and waterways. Refer to the Standard Specification Section 212 for additional requirements.

All disturbed areas within the Right-of-Way which are not surfaced shall be re-vegetated to replicate or enhance native vegetative communities. Re-vegetation species that attract wildlife to the Highway or practices that allow noxious weeds shall not be used.

Due to high failure rates the Contractor will not be allowed to use hydromulching and/or hydroseeding or straw.

Seeding shall be drilled 1/4-inch to 1/2-inch into the soil. In areas where machine seeding is impossible, hand broadcast at double the contract rate, and rake 0.25 inch to 0.5 inch into the soil.

Mulch tackifier shall be applied at a rate of 200 pounds per acre.

Mulching application shall be 1.5 tons of certified weed free hay per acre mechanically crimped into the soil in combination with organic mulch tackifier.

Soil conditioning and fertilizer requirements are as follows:

Soil Conditioning (Acre)		
Biological nutrient organic based fertilizer (lbs/acre)*	Humate (lbs/acre)	Compost (cys/acre) (1/2 inch depth)
600	200	65

At rehab bridge locations Approved seeded areas shall have soil retention blankets.

Roadside ditches shall be lined with soil retention blanket or turf reinforcement blanket to contain the design flow width (wetted perimeter), designed based on the hydraulics of the ditch for both before and after the final stabilization is established. If soil retention blanket is used, mulch and tackifier are not required.

17.2.9 Reseeding Operations and Corrective Stabilization

Prior to final acceptance

1. Seeded areas shall be reviewed during the 14 day inspections by the Erosion Control Supervisor for bare soils caused by surface or wind erosion. Bare areas caused by surface or gully erosion, blown away mulch, etc. shall be re-graded, seeded, mulched and have mulch tackifier (or blanket) applied as necessary.
2. Seeded areas shall be irrigated until seeding is established.
3. The Contractor shall maintain seeding/mulch/tackifier, mow to control weeds or apply herbicide to control weeds in the seeded areas until Final Acceptance.

The Contractor shall use the following seed mixes for locations within the Project:

COMMON NAME	BOTANICAL NAME	POUNDS (PLS/Acre)
Blue grama	Bouteloua gracilis v. Hachita	2
Western wheatgrass	Pascopyrum smithii v. arriba	6
Sideoats grama	Bouteloua curtipendula v. Vaughn	3
Little bluestem	Schizachyrium scoparium 'Pastura'	3
Green needlegrass	Stipa viridula v. Lordom	3
Buffalo grass	Bouteloua dactyloides 'Plains'	3
Junegrass	Koeleria macrantha	0.2
Prairie coneflower	Ratibida columnifera	0.3
Blue flax	Linum lewisii appar	1
Oats	Avena sativa	3
TOTAL		24.5

17.2.10 Slope Treatment and Landscaping

All slopes shall be per the Project Aesthetic Design Guidelines in Book 4 – Contract Drawings. Any slopes not defined in Book 4 – Contract Drawings shall be landscaped as follows:

1. Slopes steeper than 6:1 shall be rock as designed in Book 4 – Contract Drawings or concrete slope paving where Approved by CDOT prior to any landscaping.
2. Slopes flatter than 6:1 may be seeded or rocked. The landscaping material shall be Approved by CDOT prior to any landscaping.

17.2.11 East River Street Slope Treatment and Landscaping

As per the map in Book 5 – Reference Documents, the East River Street slope treatment and landscaping shall meet the following requirements:

1. There shall be an all-weather road provided to access the sanitary sewer manholes on River Street.
2. All slopes steeper than 3:1 within the grading boundaries shall graded to a maximum slope of 3:1.
3. Fill heights over existing sanitary manholes shall not exceed 10 feet.
4. There shall be an all-weather road along the existing Kelly Street alignment to access the existing (or relocated) water line.
5. The top 1 foot of embankment shall be topsoil.
6. The Final surface shall be permanently native seeded.
7. The existing asphalt pavement surfaces of River, Kelly, and Bradford shall be removed.
8. Removable bollards shall be installed across Bradford north of the secondary access for 217 S Bradford Ave to keep vehicles from accessing the all-weather access road.
9. Curb and gutter and driveway cutout shall be placed in front of 217 Bradford Ave.

~~The Contractor shall fill and grade the purchased parcel at 234 E. River Street and vacated roadway at a maximum of 3:1 from Bradford Street to where the slope will tie to the all-season surface utility road on Kelly Street. Sanitary manholes in this area can only be raised a maximum of 10 feet. The top 1 foot of the embankment shall be topsoil. The final surface shall be permanently native seeded.~~

17.2.12 Noxious Weed Management Plan

Identify and provide a Noxious Weed Management plan if state noxious weeds are present. The Noxious Weed Management Plan shall be submitted to CDOT for Acceptance prior to disturbance.

The Contractor shall use CDOT's standard protocol for weed management, including the development of an Integrated Noxious Weed Management Plan (INWMP) to mitigate the potential adverse effects of earth disturbance.

17.2.13 Landscape Establishment Period

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 Standard Specifications and herein.

The Landscape Establishment Period will last for 12 months, and will begin the following spring if Project Final Acceptance is issued in the fall.

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 Standard Specifications 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.

The Landscape Establishment Period can run concurrently with the Project Warranty Period and

the Wetland Establishment Period. Both the Landscape Establishment and Wetland Establishment Periods could extend past the Project Warranty Period.

17.3 Deliverables

At a minimum, the Contractor shall submit the following to CDOT for review, Approval and/or Acceptance:

Deliverable	review, Acceptance or Approval	Schedule
Final Landscape Plan	Acceptance	Prior to Landscaping
Slopes steeper than 6:1 landscaping material	Approval	Prior to Landscaping
Slopes flatter than 6:1 landscaping material	Approval	Prior to Landscaping
Noxious Weed Management Plan	Acceptance	Prior to disturbance
Organic Soil Amendment Certificate of Compliance	Acceptance	At least 30 Days prior to its use on the Project
Organic Soil Amendment Compost CDPHE facility permit to produce or sell compost	Acceptance	Prior to application
Organic Soil Amendment Compost U.S. Composting Council's Seal of Testing Assurance Program (STA) participation certificate and test data on a Compost Technical Data Sheet	Acceptance	Prior to application

All deliverables shall also conform to the requirements of Section 3 - Quality Management.