St. Vrain Creek Reach 3 Phase 2 Restoration Construction Specifications, Revision 1
Boulder County, Colorado

Prepared for:

U.S. Department of Housing and Urban Development
Colorado Department of Local Affairs
and
Boulder County Collaborative
Community Development Block Grant – Disaster Recovery Public Infrastructure Program

Prepared by:

Boulder County Parks & Open Space

and

Otak

ecos ecosystem services LLC

Project No. 019322

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PREFACE

These Construction Specifications are to be used on St. Vrain Creek Reach 3 Flood Repair and Stream Restoration Phase 2 Project (Project). These specifications are based on Mile High Flood District (MHFD) construction specifications (2015), individual specifications can be found by referencing https://udfcd.org/specifications. In some cases, specifications are a modification of the Colorado Department of Transportation (CDOT) Standard Specifications for Road and Bridge Construction 2019 (CDOT 2019). Individual specifications can be found by referencing CDOT 2019. Copies of CDOT 2019 may be obtained online or from the Colorado Department of Transportation, Office of Bid Plans, 4201 E. Arkansas Avenue, Denver, CO 80222.

The Table of Contents has been modified from MHFD (2015), and CDOT (2019) for specifications identified, to reflect specifications that are applicable to the Project. Specifications that are deemed to not apply are omitted from the table of contents. If during the construction, a specification that has been omitted is deemed applicable the CONTRACTOR will be notified. Modifications to MHFD General Conditions or Technical Specifications are made in SECTION 00 73 00 SUPPLEMENTARY CONDITIONS.

These specifications are expressed in United States Standard Measure (English units). The international System of Units (SI, Modernized Metric) is used only where standardized testing requires metric units. For clarity, aggregate sieve sizes appear in both SI and English Units. The dimensions, measurements, and requirements stated in English units are the specification requirements. All CONTRACTOR submittals shall be prepared in English Units. Pay item quantities will be measured in English units.

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DIVISION 00: PROCUREMENT & CONTRACTING REQUIREMENTS

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00 40 00: PROCUREMENT FORMS AND SUPPLEMENTS

00 50 00: CONTRACTING FORMS AND SUPPLEMENTS

00 60 00: PROJECT FORMS

00 70 00: CONDITIONS OF THE CONTRACT

00 73 00: Supplementary Conditions

01 GENERAL CONDITION Article 02 will be modified as follows: OWNER for this PROJECT is Boulder County Parks & Open Space (BCPOS). BCPOS Project Manager / OWNER contact is Sharla Benjamin or designated representative. BCPOS Vegetation Specialist contact is Carrie Cimo or designated representative. BCPOS Wildlife Specialist contact is Susan Spaulding or designated representative. BCPOS Water Resources Specialist contact is Audrey Butler or designated representative.

02 GENERAL CONDITION Article 02 will be modified as follows: ENGINEER for this PROJECT is Otak. Otak's contact is Tracy Emmanuel. VEGETATION SPECIALIST for this PROJECT is Ecos. Ecos's contact is Grant Gurnée.

03 GENERAL CONDITION Article 02 will be modified to include: SVC - St. Vrain Creek; "REACH 3 PHASE 1" - is St. Vrain Creek Reach 3 Phase 1 Restoration Project; DBH – is Diameter at Breast Height which is considered to be 4.5 feet above ground for this project; Best Management Practice (BMP) is equivalent to Control Measure (CM).

04 GENERAL CONDITION Article 15 will be modified to also include Boulder County Parks & Open Space as additional insured under CONTRACTOR's Liability Insurance.

05 OWNER and CONTRACTOR shall determine the final location and size of the staging area for the PROJECT prior to construction. CONTRACTOR shall be responsible for securing a staging area.

06 It is CONTRACTOR's responsibility to maintain survey control stakes. Survey control for the construction staking has been provided on the DRAWINGS.

07 Representatives of OWNER, State of Colorado, Applicable Federal Agencies, or the United States Army Corps of ENGINEERs (USACE) may inspect the PROJECT at any time.

08 CONTRACTOR shall forward the following submittals to OWNER for review and acceptance prior to any construction:

.01 A detailed construction schedule as specified in DIVISION 01: GENERAL REQUIREMENTS, Section 01 32 00. Construction Progress Documentation is to be submitted at the pre-construction conference.

.02 A Water Control Plan and a Plan to Lease or Purchase Water submitted at the pre-construction conference.

.03 Certificates of Insurance of the types and limits as specified in GENERAL CONDITIONS, Article 15, provided prior to start of WORK.

.04 Executed "Letter of Damage Guarantee."

.05 PERFORMANCE and PAYMENT BONDS, provided within ten (10) days after receipt of NOTICE OF AWARD.

.06 All material submittals, including riprap, boulders, grout, and any other materials to be used in the construction. The cost of the submittals will not be measured and paid for separately but will be included in the cost of the WORK.

.07 Traffic Control Plan, including all haul routes to and from approved sources of materials, disposal sites for excavated material, and disposal of all other types of materials.

.08 List of construction equipment including make, model, attachments; SDS and technical data on bio-hydraulic fluid where appropriate; and associated Exhaustion Emission Compliance Documentation and Decontamination Plan. Equipment that will enter water shall utilize an OWNER-approved bio-hydraulic fluid.

.09 Storm Water Management Plan and Spill Plan

.10 Construction Schedule.

.11 Certifications and licenses as listed in the bid documents and required for construction means and methods, including but not limited to Traffic Control Supervisor, Flagger, Forester, American Welding Society, Herbicide Certified Operator, Herbicide Qualified Supervisor, Professional Land Surveyor, Certified Storm Water Inspector.

.12 Detailed Landscape Maintenance Plan and Schedule including invasive species treatment schedule and plan, if needed, and Irrigation Plan.

09 The anticipated start date for this PROJECT is early June 2020 to begin submittal approval and acquisition of staging area and permits.

10 CONTRACTOR shall provide OWNER with a red-lined set of as-constructed DRAWINGS for the PROJECT, showing those items of WORK that were modified during construction.

11 SECTION 01 13 00 SITE CONDITIONS

Part 3, Subsection 3.04 EASEMENTS AND ACCESS PERMITS
ADD the following paragraphs after paragraph 3.04.F:

G. Access is restricted on the BNSF ROW. BNSF ROW access is restricted to employees covered under the Temporary Access Permit.

12 SECTION 01 29 00 PAYMENT PROCEDURES

Subsection 1.02 MEASUREMENT AND PAYMENT PROCEDURES

REPLACE section b. of the pay item in GN – GENERAL, Bid Item GN-02-001 Mobilization:

b. Fifty (50) percent of the lump sum price will be paid at the time of the first monthly progress payment; an additional thirty (30) percent will be paid when one-half the original CONTRACT amount is earned. The remaining twenty (20) percent will be paid upon final acceptance of the PROJECT. The total amount for mobilization will not exceed ten (10) percent of the total BID.

Bid Item	Pay Unit
Mobilization	LS

REPLACE section b. of the pay item in ESC – EROSION AND SEDIMENT CONTROL, Bid Item ESC-01-001 General BMP Maintenance:

a. Payment will be based on units completed and accepted

Bid Item	Pay Unit
General BMP Maintenance	HR

MODIFY the pay item in E. ESP – EARTHWORK AND SUBGRADE PREPARATION, Bid Item ESP-02-002 to add the following to section a.:

8) Offsite haul location for excess material is assumed to be 5201 St Vrain Rd, Longmont, CO 80503. No haul vehicles allowed on N. 75th Street in the vicinity of the Hygiene Elementary School: use alternate routes including Airport Road and Hover Street.

ADD the following pay item in E. ESP – EARTHWORK AND SUBGRADE PREPARATION:

Bid Item ESP-09-001: Fine Channel Grading
Bid Item ESP-09-001: Fine Floodplain Grading

a) The measurement for payment for this item will be the actual number of square feet of channel or floodplain to be graded accordance with the DRAWINGS and SPECIFICATIONS or as otherwise directed by the ENGINEER. No measurement of this item will be made unless a change is required by a WORK CHANGE DIRECTIVE or changes to the CONTRACT DOCUMENTS are made, in which case the ENGINEER will perform measurement of the modified area. The quantity is based on the neat lines shown on the DRAWINGS. The unit price will include all of the CONTRACTOR's costs. This BID item includes, but is not limited to:
   1) Excavating, reworking, placing and compacting material within the PROJECT area

2) Creating micro topography features in the floodplain
3) Channel shaping to create a low flow channel, bars, small pools or other habitat features within the channel extents.
4) Providing all other related and necessary labor, equipment, and materials required to complete the WORK

b. Payment will be based on units completed and accepted

Bid Item	Pay Unit
Fine Channel Grading	SY
Fine Floodplain Grading	SY

MODIFY pay item in RR – REMOVE, RELOCATE, AND ABANDON, Bid Item RR-06-018 Remove Tree to add the following to section a.:

6) All trees/shrubs (with the exception of crack willow and Russian olive) removed during clearing and grubbing shall be stockpiled onsite for use in habitat features or chipped and spread on floodplain as directed by OWNER OR ENGINEER.
7) Crack willow and Russian olive removed during clearing and grubbing will be disposed of offsite in an approved disposal location.

ADD the following pay items in F. RW – ROCKWORK:

Bid Item RW-13-001: Cobbles, Import

a) The measurement for payment for this item will be the actual number of cubic yards of cobbles to be imported from an offsite source to be properly stockpiled and placed along the finished lines and grades in accordance with the DRAWINGS and SPECIFICATIONS or as otherwise directed by the ENGINEER. Measurement of this item will be completed by the ENGINEER and will measured by the truckload via tickets in accordance with the DRAWINGS and SPECIFICATIONS or as otherwise directed by the ENGINEER. The unit price will include all of the CONTRACTOR's costs. This BID item includes, but is not limited to:
   1) Locating, supplying, and transporting of approved material
   2) Stockpiling with CMs
   3) Providing all other related and necessary labor, equipment, and materials required to complete the WORK

c. Payment will be based on units completed and accepted

Bid Item	Pay Unit
Cobbles, Imported	CY

REPLACE pay item in LS - LANDSCAPING, Bid Item LS-02-004: Erosion Control Blanket/Fabric with the following:

a. The measurement for payment for this item will be in accordance with CDOT 2019 Section 216 and associated revisions summarized in SUPPLEMENTARY SPECIFICATIONS Section 91.

    1. This item of work shall include all work, labor, materials and equipment necessary to install erosion control blanket/fabric as shown on the Drawings. The materials and installation shall be in accordance to the Drawings and Specifications.

b. Payment for this item shall be made on a unit price basis per square yard installed and accepted finish surface, excluding overlap, and per wood stake installed and accepted.

REPLACE pay item in LS - LANDSCAPING, Bid Item LS-07-001: Mulch with the following:

a. The measurement for payment for this item will be in accordance with CDOT 2019 Section 213 and associated revisions summarized in SUPPLEMENTARY SPECIFICATIONS Section 91.

    1. Spray-On Mulch Blanket – This item of work shall include all work, labor, equipment and materials necessary to supply and install a OWNER approved Spray-On Mulch to the Zones 2, 3, 4 and 5 locations shown on the Drawings. The materials and installation shall be in accordance to the Drawings and Specifications. The quantity of Spray-On Mulch Blanket 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.

b. Payment for this item shall be made on a unit price basis per acre Spray-On Mulch Blanket applied. Hydrolmulch and tackifier shall be paid for together as Spray-On Mulch Blanket.

REPLACE pay item in LS - LANDSCAPING, Bid Item LS-10-006, and LS-10-008: Seeding with the following:

a. The measurement for payment for this item will be in accordance with CDOT 2019 Section 212 and associated revisions summarized in SUPPLEMENTARY SPECIFICATIONS Section 91.

   1. Wetland Seeding – This item of work shall include all work, labor, equipment and materials necessary to install an OWNER supplied Wetland Seed Mix to the Zone 2 locations shown on the Drawings. The materials and installation shall be in accordance to the Drawings and Specifications. Species and seeding rates for Wetland Seeding shall be as indicated on the seed schedules and all certifications shall be supplied to the CONTRACTOR. This item of work shall include weed control and watering during the construction establishment period of 120 days after installation.

   2. Upland and Riparian Seeding – This item of work shall include all work, labor, equipment and materials necessary to install an OWNER supplied Upland and Riparian Seed Mix to the Zones 3, 4 and 5 locations shown on the Drawings. The materials and installation shall be in accordance to the Drawings and Specifications. Species and seeding rates for Upland and Riparian Seeding shall be as indicated on the seed schedules and all certifications shall be supplied to the CONTRACTOR. This item of work shall include weed control and watering during the construction establishment period of 120 days after installation.

b. Payment for this item shall be made on a unit price basis per acre of wetland/upland/riparian native seeding supplied and installed.

REPLACE pay item in LS - LANDSCAPING, Bid Item LS-11-003: Shrub/Planting with the following:

a. The measurement for payment for this item will be in accordance with CDOT 2019 Section 214 and associated revisions summarized in SUPPLEMENTARY SPECIFICATIONS Section 91.

   1. Upland and Riparian Trees & Shrubs 14" Tall 1-GAL – This item of work shall include all work, labor and equipment necessary to supply and install OWNER approved Upland and Riparian Trees & Shrubs to the locations in Zone 3 and Zone 4 as shown on the Drawings. The materials and installation shall be in accordance to the Drawings and Specifications. This item of work shall include weed control and watering during the construction establishment period of 120 days after installation. This item of work shall include all materials and labor to supply and install wood chip mulch at each potted tree and shrub location.

b. Payment for this item shall be made on a unit price basis per each tree/shrub installed.

REPLACE pay item in LS - LANDSCAPING, Bid Item LS-14-004: Willow Stakes with the

following:

a. The measurement for payment for this item will be in accordance with CDOT 2019 Section 214 and associated revisions summarized in SUPPLEMENTARY SPECIFICATIONS Section 91.

   1. Willow Cuttings – This item of work shall include all work, labor, and equipment necessary to harvest and transplant Willow Cuttings to the locations in Zone 2 as shown on the Drawings. The materials and installation shall be in accordance to the Drawings and Specifications. Size and form of Willow Cuttings shall be as indicated on the plant schedules. This item of work shall include weed control and watering during the construction establishment period of 120 days after installation. Willow cuttings are installed into the water table and thus watering is optional to ensure survival for the warranty period, not required.

b. Payment for this item shall be made on a unit price basis per each cutting harvested and transplanted.

ADD the following pay items in M. LS - LANDSCAPING:

Bid Item LS-20-001: Wetland Trees and Shrubs

a. The measurement for payment for this item will be (in accordance with CDOT 2019 Section 215 and associated revisions summarized in SUPPLEMENTARY SPECIFICATIONS Section 91) per each tree/shrub installed in accordance with the DRAWINGS and SPECIFICATIONS or as otherwise directed by the ENGINEER/VEGETATION SPECIALIST. The unit price will include all of the CONTRACTOR's costs. This BID item includes, but is not limited to:

   1) Providing all other related and necessary work, labor and equipment to transport and install Trees & Shrubs to the locations in Zone 2 as shown on the Drawings.
   2) The materials and installation shall be in accordance to the Drawings and Specifications.
   3) Size and form of trees/shrubs shall be as indicated on the plant schedules.
   4) This item of work shall include weed control and watering during the construction establishment period of 120 days after installation.
   5) All materials and labor to supply and install wood chip mulch at each potted tree and shrub location.

b. Payment will be based on units completed and accepted

Bid Item	Pay Unit
Tree/shrub Planting	EA

Bid Item LS-21-001: Wetland Trees and Shrub Clump Transplants

a. The measurement for payment for this item will be (in accordance with CDOT 2019 Section 215 and associated revisions summarized in SUPPLEMENTARY SPECIFICATIONS Section 91) per each tree/shrub harvested and transplanted in accordance with the DRAWINGS and SPECIFICATIONS or as otherwise directed by the ENGINEER/VEGETATION SPECIALIST. The unit price will include all of the CONTRACTOR's costs. This BID item includes, but is not limited to:
   1) This item of work shall include all work, labor and equipment necessary to harvest and transplant Riparian and Wetland Tree/Shrub (Clump) Transplant to the locations specified in the field by the BCPOS Vegetation Specialist and/or VEGETATION SPECIALIST.
   2) This item of work shall include weed control and watering during the construction establishment period of 120 days after installation.
   3) The materials and installation shall be in accordance to the Drawings and Specifications.

b. Payment will be based on units completed and accepted

Bid Item	**Pay Unit**
Wetland Tree/Shrub Clump Harvesting and Transplant	EA

Bid Item LS-21-002: Riparian/Upland Tree/Shrub Clump Transplants

a. The measurement for payment for this item will be (in accordance with CDOT 2019 Section 215 and associated revisions summarized in SUPPLEMENTARY SPECIFICATIONS Section 91) per each tree/shrub harvested and transplanted in accordance with the DRAWINGS and SPECIFICATIONS or as otherwise directed by the ENGINEER/VEGETATION SPECIALIST. The unit price will include all of the CONTRACTOR's costs. This BID item includes, but is not limited to:
   1) This item of work shall include all work, labor and equipment necessary to harvest and transplant tree/shrub to the locations specified in the field by the BCPOS Vegetation Specialist and/or VEGETATION SPECIALIST.
   2) This item of work shall include weed control and watering during the construction establishment period of 120 days after installation.
   3) The materials and installation shall be in accordance to the Drawings and Specifications.

b. Payment will be based on units completed and accepted

Bid Item	Pay Unit
Riparian/Upland Tree/shrub Clump Harvesting and Transplant	EA

<u>ADD</u> the following section after N. UT – UTILITY:

O. UC – UNCLASSIFIED

1. Bid Item UC-02-001 Stop Log Bays

   a. The measurement for payment for this item will be lump sum stop log bay installed in accordance with the DRAWINGS and SPECIFICATIONS or as otherwise directed by the ENGINEER. The unit price will include all of the CONTRACTOR's costs. This BID item includes, but is not limited to:

      1) Acquisition and transportation of material
      2) Altering material to designed lengths/required dimensions, if necessary
      3) Providing all other related and necessary labor, equipment, and materials to complete the WORK
      4) Stop Log Bays shall include the following items:
         (a) Stacked (cubed) and grouted boulders
         (b) Stop log frame, guides, sill plates, catwalk support and required welding.
         (c) Stop log and catwalk lumber
         (d) Grout washout area

   b. Payment will be based on units completed and accepted

Bid Item	Pay Unit
Stop Log Bays	LS

2. Bid Item UC-03-001 Topsoil Conditioning (Compost, Upland-Riparian)

   a. This set of items includes all work necessary to install topsoil conditioning (compost) item according to the Drawings and Specifications. At a minimum, this item should include the following:

      1) <u>Class 1 Compost</u> – This item of work shall include all work, labor, equipment and materials necessary to supply a OWNER approved A-1 Organics Biocomp (or equivalent), Class 1 Compost at 3 CY/AC to Zones 3, 4 and 5 (locations shown on the Drawings). The materials shall be in accordance to the Drawings and Specifications.

2) Application and Tillage – This item of work shall include all work, labor, equipment and materials necessary to transport, spread, apply and till at 6" - 12" depth multiple passes the soil amendments to the Zones 3, 4 and 5 locations shown on the Drawings. The materials and installation shall be in accordance to the Drawings and Specifications.

b. Payment will be based on units completed and accepted

Bid Item	**Pay Unit**
Topsoil Conditioning (Compost, Upland-Riparian)	AC

3. Bid Item UC-03-002 Topsoil Conditioning (Compost, Wetland)

a. This set of items includes all work necessary to install topsoil conditioning (compost) item according to the Drawings and Specifications. At a minimum, this item should include the following:

1) Class 1 Compost – This item of work shall include all work, labor, equipment and materials necessary to supply a OWNER approved A-1 Organics Biocomp (or equivalent), Class 1 Compost at 6 CY/AC to Zone 2 (locations shown on the Drawings). The materials shall be in accordance to the Drawings and Specifications.

2) Application and Tillage – This item of work shall include all work, labor, equipment and materials necessary to transport, spread, apply and till at 6" - 12" depth multiple passes the soil amendments to the Zone 2 at locations shown on the Drawings. The materials and installation shall be in accordance to the Drawings and Specifications.

b. Payment will be based on units completed and accepted

Bid Item	**Pay Unit**
Topsoil Conditioning (Compost, Wetland)	AC

4. Bid Item UC-03-003 Topsoil Conditioning (Biotic Soil Media)

a. This set of items includes all work necessary to install topsoil conditioning (Biotic Soil Media) item according to the Drawings and Specifications. At a minimum, this item should include the following:

1) Biotic Soil Media – This item of work shall include all work, labor, equipment and materials necessary to supply a OWNER approved Proganics Biotic Soil Media to any locations where insufficient depth of topsoil is realized after stockpiled material has been replaced after grading, as directed by the ENGINEER, VEGETATION SPECIALIST or BCPOS Vegetation Specialist. Proganics Biotic Soil Media applied at a rate of 4000 lb/ac is equivalent to 4" of topsoil. Proganics Biotic Soil Media may be applied to Zones 2, 3, 4, and 5 locations shown on the Drawings, only in locations where Bid Item UC-03-004 was NOT applied. The materials shall be in accordance to the Drawings and Specifications.

2) Application and Tillage – This item of work shall include all work, labor, equipment and materials necessary to transport, combine, and apply with Bid Item UC-003-01 or UC-003-02.

b. Payment will be based on units completed and accepted

Bid Item	Pay Unit
Topsoil Conditioning (Biotic Soil Media)	AC

5. Bid Item UC-03-004 Topsoil Conditioning (Fertilizer with Additives)

a. This set of items includes all work necessary to install topsoil conditioning (Fertilizer with Additives) item according to the Drawings and Specifications. At a minimum, this item should include the following:

1) Sustane 3-7-2 (or equivalent) w/ Mycorrhizae and Humates Organic Fertilizer – This item of work shall include all work, labor, equipment and materials necessary to supply a OWNER approved Sustane 3-7-2 w/ Mycorrhizae and Humates Organic Fertilizer at the manufacturer's recommended rate to Zones 3, 4 and 5 locations shown on the Drawings, only in locations where Bid Item UC-03-003 was NOT applied. The materials shall be in accordance to the Drawings and Specifications.

2) Application and Tillage – This item of work shall include all work, labor, equipment and materials necessary to transport, combine, and apply with Bid Item UC-003-01.

b. Payment will be based on units completed and accepted

Bid Item	Pay Unit
Topsoil Conditioning (Fertilizer with Additives)	AC

6. Bid Item UC-04-001 Rootwad Log Installation

   a. The measurement for payment for this item will be per each rootwad log installed in accordance with the DRAWINGS and SPECIFICATIONS or as otherwise directed by the ENGINEER. The unit price will include all of the CONTRACTOR's costs. This BID item includes, but is not limited to:

      1) Providing all other related and necessary labor, and equipment to install rootwads, as identified on the Drawings, which includes, but is not limited to, excavation, installing trees/logs, installing ballast rock, and all incidental and miscellaneous work and cleanup, and all else incidental thereto, for which separate payment is not provided under other items in the Bid Form.
      2) Rootwads/logs will be salvaged onsite during clearing and grubbing/excavation.
      3) Ballast rock will be salvaged onsite during excavation work covered in another pay item.
      4) No payment will be made for rootwads furnished and installed by the CONTRACTOR beyond the quantity established in the DRAWINGS unless prior approval is obtained by the ENGINEER or OWNER.

   b. Payment will be based on units completed and accepted

Bid Item	**Pay Unit**
Rootwad Log Installed	EA

7. Bid Item UC-04-002 Small Wood Habitat Feature Installation

   a. The measurement for payment for this item will be per cubic yard of small wood/shrub material installed as small wood habitat features in accordance with the DRAWINGS and SPECIFICATIONS or as otherwise directed by the ENGINEER. The unit price will include all of the CONTRACTOR's costs. This BID item includes, but is not limited to:

      1) Providing all other related and necessary labor, and equipment to install small wood habitat feature, as identified on the Drawings, which includes, but is not limited to, excavation, installing small wood, installing ballast rock, and all incidental and miscellaneous work and cleanup, and all else incidental thereto, for which separate payment is not provided under other items in the Bid Form.
      2) Small wood will be salvaged onsite during clearing and grubbing work covered in other pay items.
      3) No payment will be made for small wood feature installed by the CONTRACTOR beyond the quantity established in the bid quantities unless prior approval is obtained by the ENGINEER or OWNER.

b. Payment will be based on units completed and accepted

Bid Item	Pay Unit
Small Wood Habitat Feature Installed	CY

8. Bid Item UC-05-001 Water Rights

a. The measurement for payment for this item will be lump sum for the lease of water rights for use during the project construction and warranty period (1 year after project acceptance). The unit price will include all of the CONTRACTOR's costs.

b. Payment will be based on units completed and accepted

Bid Item	Pay Unit
Water Rights	LS

13 SECTION 01 56 39 TEMPORARY TREE AND PLANT PROTECTION

Part 3, Subsection 3.01 GENERAL

ADD the following paragraphs after paragraph 3.01.C:

A. All protective fencing shall be maintained and repaired as soon as cut/broken/or otherwise damaged

B. Where repeated damage (greater than two episodes of damage) to a protective barrier has occurred; a stronger barrier and signage will be installed to protect an area

14 SECTION 01 56 39 TEMPORARY TREE AND PLANT PROTECTION

Part 3, Subsection 3.02 PROTECTED AREAS

REPLACE paragraphs 3.01.A.1 and 3.01.A.2 with the following paragraphs:

1. Prior to construction the CONTRACTOR, ENGINEER, and OWNER will walk the site to determine the access routes, necessary staging areas, vehicle parking areas. All other areas outside of the designated construction impact area shall be considered designated protected areas. No vehicle parking, staging, or access corridors shall occur in designated protected areas.

2. No parking areas or access shall occur closer than the full drip line of trees, unless specifically allowed in a field order written communication.

3. Any branches which are in the way of construction equipment and require pruning shall be pruned with sharp pruners, pruning saw, to the next crotch or trunk of the tree without tearing or otherwise damaging the bark collar on the remaining portion of the tree.

4. Any shrub thickets within construction areas to be filled shall be filled around carefully to leave some aboveground portion of the shrub visible as grade is elevated. In areas which will remain at the same elevation, native shrubs or trees which occur within and block approved construction access routes shall be pruned to the ground, with roots left undisturbed and allowed to regrow following construction.

5. Any existing grasslands which are designated for protection, including shortgrass prairie and saltgrass areas, shall be fenced to prevent damage occurring from impact by vehicle traffic, parking, storage, or foot traffic.

6. All existing shrub and tree areas outside of designated construction access, staging, and grading areas shall be protected from impact by vehicle traffic, parking, storage, or foot traffic.

15 SECTION 01 57 19 TEMPORARY ENVIRONMENTAL CONTROLS

Part 3, Subsection 3.01 DUST CONTROL

ADD the following paragraphs after paragraph 3.01.C:

D. The CONTRACTOR shall carry out proper and efficient measures wherever and as often as necessary to reduce the dust nuisance, and to prevent dust from damaging crops, orchards, cultivated field, and dwellings, or causing a nuisance to persons. The CONTRACTOR shall be held liable for any damage resulting from dust originating from operations under these specifications on Boulder County property or elsewhere.

Part 3, Subsection 3.05 WATER QUALITY CONTROL
ADD the following paragraphs after paragraph 3.05.O:

P. **Readily Biodegradable Hydraulic fluids:**
Equipment operating within or adjacent to any surface waters shall be free of fluid leaks.

All fueling, oiling, or maintenance of equipment shall be performed in designated upland locations, with adequate CMs to contain potential spills.

Readily biodegradable hydraulic fluids or "bio-hydraulic fluids" shall be utilized for all equipment operating in water and shall not have a mineral oil base. The CONTRACTOR shall submit certification of the use of non-toxic, readily biodegradable hydraulic fluids for equipment operated in water to the ENGINEER and OWNER for approval prior to use.

All equipment with bio-hydraulic fluids shall be visibly marked and readily identifiable at a distance of 100-ft.

Base oil is preferred in the following order: vegetable oil preferred over synthetic esters or polyalkylene glycols. Bio-hydraulic fluids that have had more testing completed for Section 12 of the SDS Data Sheet for EPA VGP EAL Compliant or EU EcoLabel Compliance are preferred over no data available.

Acceptable readily biodegradable fluids will meet the following criteria in Section 12 of the SDS Data Sheets (Any exceptions must be approved by the OWNER.)

1. AQUATIC/ECOTOXICITY: Based on previous studies, LC50/EC50 is greater than 3,000 ppm (3000 mg/L) (amount of substance that kills 50 percent of the test animals in a given time).
2. BIODEGRADATION: Ultimate Biodegradation is listed as "Readily biodegradable" >60% after 28 days (inherently biodegradable is not sufficient)*.
3. PERSISTENCE AND DEGRADABILITY: Readily biodegradable >60% after 28 days.
4. BIOACCUMULATION: Non-bioaccumulating. The base oil shall not be mineral oil.

The Project Manager shall approve the CONTRACTOR's plan for leaking equipment extraction from the creek (spill plan information to be included in SWMP) and deployment of Oil Only Sorbent/Absorbent socks and booms should a spill occur.

Multiple spill kits (emergency pollutant isolation and clean-up materials) must be on-site during all work with heavy machinery, including at the staging area and at any point of active work.

All crew members shall be trained on how to use the spill kit equipment and where the materials are kept onsite.

Q. Turbidity increases in a stream or other bodies of water that are caused by construction activities shall be limited to the increases above the natural turbidities permitted under the water quality standards prescribed for that stream or body of water. When necessary to perform required construction work in a stream channel, the prescribed turbidity limits may be exceeded, as approved by the Colorado Department of Public Health and Environment (CDPHE) in the permit received by the CONTRACTOR and also according to the Boulder County Stormwater Quality Permit, for the shortest practicable period required to complete such work. This required construction work may include such work as diversion of a stream, or specified earthwork in or adjacent to a stream channel, and construction of turbidity control structures. Mechanized equipment shall not be allowed to operate in flowing water except as necessary and permitted to construct crossings or to perform the required construction (see section P above).

Part 3, Subsection 3.06 NOISE CONTROL
ADD the following paragraphs after paragraph 3.06.D:

E. Work Hours: Hours of operations shall be limited to 8:00 a.m. to 5:00 p.m. Monday through Friday. Hauling Hours: Hours of hauling shall be limited to 8:30 a.m. to 4:30 p.m. Monday through Friday. Work on Saturdays and Sundays, mornings, nights, and federal holidays shall not be allowed unless approved in writing by the OWNER. No haul vehicles allowed on N. 75th Street in the vicinity of the Hygiene Elementary School: use alternate routes including Airport Road and Hover Street.

Part 3, Subsection 3.07 OTHER SPECIAL PROJECT CONTROL MEASURES
ADD the following paragraphs after paragraph 3.06.A:

B. Equipment and vehicles that are found to have emissions of exhaust gases or particulates that exceed applicable limits established by Federal, State or local laws or authorities, shall not be operated until corrective repairs or adjustments are made. The CONTRACTOR shall submit acceptable evidence that equipment and vehicles have been tested for exhaust emissions and have been found to be in compliance with applicable limits.

16 SECTION 01 71 13 MOBILIZATION

Part 1, Subsection 1.02 GENERAL

ADD the following paragraphs after paragraph 1.02.B:

F. No equipment shall be mobilized to the work site unless one of the following measures are taken to prevent the spread of noxious and invasive species including aquatic nuisance species (ANS):

1. Remove all soil, plant and animal material, and debris from equipment (tracks, tires, undercarriages, turrets, buckets, drags, teeth etc.) and spray/ soak equipment with a 1: 1 solution of Formula 409 Household Cleaner and water, keeping equipment wet for at least 10 minutes, and allow to dry for 5 days before mobilization OR

2. Remove all soil, plant and animal material, and debris from equipment (tracks, tires, undercarriages, turrets, buckets, drags, teeth etc.) and spray/soak equipment with water 120-140 degrees F for at least 10 minutes, and allow to dry for 5 days before mobilization

Prior to moving such equipment onto the project, the CONTRACTOR shall submit to the ENGINEER a written list of the equipment and a signed certification that it was treated using one of the two methods specified above.

Equipment must not be moved onto the project site for 5 days after cleaning. Inspection by OWNER or OWNER's designated representative of all previously used equipment is highly recommended at the cleaning location prior to the 5 day wait, or at the work property boundary (not recommended due to high chance of rejection).

New (clean) equipment can be an exception to the cleaning requirements, as approved by OWNER, but must still be inspected at the work property boundary at minimum.

Equipment removed from the project boundary and seeking re-entry will need to be cleaned again following one of the two methods above.

After project completion, this equipment shall be treated prior to its use in another stream, river, lake, pond or wetland.

G. Disturbance to the primary stream channel, side channels, and streambanks shall be minimized. Equipment shall not deviate from the designated access routes and staging areas to avoid the sensitive nature of this area as Preble's Meadow Jumping Mouse habitat.

H. Ensure adherence to the Protected Plants and Wildlife Conservation Measures as outlined in Section 240, through coordination with all parties including a third-party Biologist Contractor, and required activities from mobilization through demobilization.

17 SECTION 01 71 23 FIELD ENGINEERING AND SURVEYING

Part 1, Subsection 1.02 GENERAL
ADD the following paragraphs after paragraph 1.02.E:

A post-construction survey shall be conducted by the CONTRACTOR to survey the final stations, elevations, and dimensions of constructed in-channel features and bench grading, at a minimum. At a minimum for the post construction as-built survey shall include:

1. Thalweg survey capturing overall stream profile and grade breaks for instream structures.
2. Detailed in-stream structure survey following rock crests or edges and/or select survey at structures showing conformance to plans or changes from plans.
3. Cross section survey at minimum of 200 feet (or as specified by the ENGINEER – to match hydraulic modeling used for Floodplain Development Permit) spanning the entire regulatory floodplain. Cross sections shall capture all grade breaks along a section including thalweg, toe of slope on each bank, flood benches, and other significant geographic features.
4. All as-built survey to be provided in AutoCAD format and also include a PDF version certified by a Professional Land Surveyor.
5. Detailed survey shall be adequate to complete a Letter of Map Revision application and associated hydraulic modeling.

18 SECTION 31 11 00 CLEARING AND GRUBBING

Part 1, Subsection 1.01 SECTION INCLUDES
REPLACE the following paragraphs:

A. This WORK consists of clearing, grubbing, removing, stockpiling, and disposing of vegetation and debris within the limits of the PROJECT site as shown on the DRAWINGS and as required by the WORK. Vegetation and objects designated to remain shall be preserved free from injury or defacement.

Part 1, Subsection 1.02 RELATED SECTIONS
ADD the following to paragraph 1.02.A:

3. Section 13 40 01, Wood Features

Part 3, Subsection 3.01 GENERAL
ADD the following paragraphs after paragraph 3.01.B:

C. CONTRACTOR shall install temporary plastic fence or demarcation flagging, acceptable to the ENGINEER, as shown on the DRAWINGS, prior to commencing with the clearing and grubbing per Section 32 31 00 FENCES AND GATE. Woody material to be removed shall be approved by OWNER and ENGINEER in the field prior to work.

D. Once all clearing and grubbing is completed and approved, no additional clearing shall be allowed unless approved, in writing, by the ENGINEER.

E. Clearing and Grubbing limits, limits of disturbance fencing and flagging, and woody material to be removed shall be approved by OWNER and ENGINEER in the field prior to work.

F. No clearing and grubbing can occur prior to August 3, 2020.

Part 3, Subsection 3.02 CONSTRUCTION

REPLACE paragraphs 3.02.A and 3.02.G with the following paragraphs:

A. Clearing and grubbing shall extend to the toe of fill or the top of cut slopes or as designated on the DRAWINGS, and shall not extend beyond the limits of disturbed area for the project.

G. All cleared timber shall be stockpiled in designated stockpile area, for use in floodplain or in-channel habitat features, with the exception of crack willow and Russian olive which shall be disposed of offsite in an approved disposal location.

ADD the following paragraphs after paragraph 3.02.H:

I. Trees and branches removed under Clearing and Grubbing that are less than 1 foot DBH (trees) and 0.25 foot diameter (branches) will be chipped on site for incorporation into floodplain substrate material or as directed by ENGINEER or BCPOS Project Manager.

J. Branches removed from trees under Clearing and Grubbing that are between 0.25 and 0.5 foot in diameter and native shrub material between 3 to 5 feet in diameter and height may be used in design elements as laid out in the DRAWINGS at the direction of the ENGINEER. Woody material of this size shall be stockpiled with branches intact to the extent possible.

K. Trees greater than 1-foot DBH flagged for use in Rootwad Feature shall be removed with limbs and rootwads intact per Section 13 40 01 WOOD FEATURES. Limbs from these trees shall be used for small wood features per Section 13 40 01 WOOD FEATURES.

L. For trees with diameters equal to or less than 6-inches in diameter or trees greater than 1-foot DBH not identified for use in rootwad features (and not crack willow or Russian olive), the CONTRACTOR shall leave the stump and roots in place if they are below the proposed final grade. The portion of the stump and roots that are above the proposed final grade shall be salvaged intact with the rest of the tree for incorporation into design

elements at the direction of the ENGINEER. Woody material that cannot be re-used in project elements will be chipped and spread across the floodplain as approved by OWNER or ENGINEER.

M. Only invasive trees that do not sprout new growth from dead material (e.g., Elm) will be considered for re-use onsite, as approved by BCPOS Vegetation Specialist. All other non-native woody material (e.g., crack willow and Russian olive) shall become the property of the CONTRACTOR, and hauled off-site to an approved disposal site at the CONTRACTOR's expense. The CONTRACTOR shall make all arrangements to obtain written permission from property owners for disposal locations outside the limits and view of the project. Copies of this written agreement shall be furnished to the ENGINEER before the disposal area is used.

N. Full removal of tree roots will be required for all trees that are in conflict with excavation limits.

O. All trees cut and removed, leaving roots intact in the ground, shall have remaining stumps cut as flush to the ground as possible, with no more than 4-inches protruding above finished grades. All non-native tree species, as designated by the BCPOS Vegetation Specialist and/or VEGETATION SPECIALIST, shall have the cut stumps treated with an appropriate herbicide (refer to Section 217) within five minutes of cutting to prevent re-sprouting.

P. Trees designated for removal shall be discussed with BCPOS Vegetation Specialist prior to removal. If grading plans allow, it may be possible to avoid certain trees, or cut to the ground and allow for regrowth from the remaining roots. The CONTRACTOR shall identify and mark each tree to be removed. The ENGINEER shall be notified for inspection and approval of these marked trees. No tree greater than 6-inch DBH shall be removed without prior approval by the ENGINEER. Trees removed without prior approval of the ENGINEER shall be replaced at the CONTRACTOR's expense.

Q. Materials being stored for future use shall be stockpiled in areas designated on DRAWINGS or approved by the ENGINEER. Areas shall be protected with fence and erosion control measures.

R. Crack willow and Russian olive of any size shall be hauled offsite to an approved disposal facility. Burning of cleared material will not be permitted.

S. Siberian elm trees salvaged during clearing and grubbing shall be stockpiled for at least 3 weeks before habitat feature installation to reduce the potential re-sprouting.

T. No portion of Locusts' roots shall be used. BCPOS Vegetation Specialist can provide support as needed.

U. Existing willows should be harvested and paid for separately per Section 00 73 106 (Transplanting) and pay item LS-14-004.

V. If noxious weeds are found before grading, areas to be disturbed shall be pre-treated before grading.

W. CONTRACTOR shall harvest the limited quantity of topsoil within the limits of disturbance for the project and stockpile for later placement on the floodplain per Section 207 TOPSOIL. Existing native grasses do not need to be mowed or scalped and may be incorporated into the topsoil stripping of the site. No invasive grasses shall be incorporated into the topsoil stripping of the site.

X. All access routes, parking areas, and staging areas shall be scalped (remove 3-4" of surface material) at the start of the project to reduce the spread of weeds and weed seeds during construction. Any on site locations for placement of scalped materials must be pre- approved by the ENGINEER and BCPOS Vegetation Specialist.

Y. All areas of the site to be graded with non-native vegetation (i.e., cheat grass) shall be scalped (remove 3-4" of surface material) prior to grading to reduce weed seed contamination of the newly graded portions of the site. Haul-off to an appropriate disposal site may be required if heavily contaminated with weeds. Any on site locations for placement of scalped materials must be pre- approved by the ENGINEER and BCPOS Vegetation Specialist. Scalping shall be done very carefully to eliminate all undesirable surface vegetation and weed seed contaminated surface soils.

Z. Tree or shrub branches which are in the way of construction equipment and require pruning shall be pruned with sharp pruners, pruning saw, to the next crotch or trunk of the tree without tearing or otherwise damaging the bark collar on the remaining portion of the tree.

AA. Any shrub thicket which occurs within construction access corridors or staging areas (in locations which will not be filled or cut) shall be pruned within 4-6 inches of the ground. These plants will regrow from their roots following completion of construction.

BB. Any shrub thickets within construction areas to be filled shall be filled around carefully to leave some aboveground portion of the shrub visible, if possible, as grade is elevated.

19 SECTION 31 23 00 EXCAVATION AND FILL

Part 1, Subsection 1.01 SECTION INCLUDES
REPLACE paragraph 1.01.B with the following:

B. All excavation shall be classified, "unclassified excavation", "muck excavation", "rock excavation", or "fine grading" as hereafter described. All embankment shall be classified "embankment material" as hereafter described.

Part 1, Subsection 1.04 DEFINITIONS
ADD the following paragraphs after 1.04 D:

E. Native Alluvium shall consist of the native material present at the project site. This is classified as alluvium, which is material placed in an area by river processes and typically includes a well graded mix of silt, sand, gravel, cobble and possibly boulders.

F. Fine Grading shall consist of moving native alluvium or channel bed material within which was either present on site or installed as part of other mass grading activities in cut and or fill within the PROJECT limits to create finished surfaces that have a natural appearance and increase habitat function.

Part 2, Subsection 2.01 MATERIALS
REPLACE paragraph 2.01.A with the following paragraph:

A. Embankment Material may consist of native alluvium or an approved equivalent hauled from outside the PROJECT limits.

ADD the following paragraphs after 2.01 F:

1. Channel Bed Material shall consist of coarse sediment deposits which is typically occur in the top layer of material in active channel beds, abandoned channel beds, and floodplains near channel margins. It's composed of cobbles and gravels with some sand and silt. At this PROJECT, the typical D_{50} of the Channel Bed Material is 3"-4". The top layer is assumed to be the top 0.5'-1.5' of material but may vary by location.

Part 3, Subsection 3.01 GENERAL EXCAVATION/EMBANKMENT
REPLACE paragraph 3.01.A.5. with the following paragraph:

5. Excavation and stockpiling operations shall be conducted so that materials outside of the limits of disturbance as depicted on the DRAWINGS are not disturbed, Access to the stream may only be conducted from the Creek Temporary Access locations specified on the DRAWINGS. Limits of Disturbance depicted on the DRAWINGS correspond with limits of Preble's Meadow Jumping Mouse disturbance areas approved in the NEPA Environmental Clearance and therefore must be adhered to in order to maintain compliance with approved permits.

ADD the following paragraphs after 3.01 B.1.d.:

e. Existing river conditions prior to ground disturbing activities shall be carefully documented with photographs or other approved method. The CONTRACTOR shall immediately notify the ENGINEER if the existing conditions appear to significantly vary from the surveyed topography shown on the DRAWINGS.

f. The specific location of certain riffle crests and pool tail-outs may be adjusted under the supervision of the ENGINEER to better match existing conditions and minimize bed disturbance if field conditions differ from the existing conditions shown in the DRAWINGS.

g. The final compaction level of the graded areas shall be consistent with the intent to re-establish vegetation. Final compaction level shall be approved by the ENGINEER.

ADD the following paragraphs after 3.01 D:

E. Fine Grading

1. Fine grading in the channel includes small-scale shaping of riffles, pools, runs, bars, low flow channel and banks to create natural variation not shown on the DRAWINGS which both improves the aesthetic appearance and habitat functions such as fish passage and cover. Where practicable, fine grading in run segments shall consist of shifting river substrate across the channel to enhance the existing low-flow channel shape without extensive disturbance to the bed.

2. Fine grading in the floodplain includes the creation of micro-topography not shown on the DRAWINGS to create a more natural appearance and increase habitat variability. This can include bank shaping to create more natural slope variability and creating small features lower than surrounding elevations which will inundate at variable flows.

3. Fine grading shall be done under the direction of the ENGINEER and a minimum of 48 hours notice provided to the ENGINEER.

4. Fine channel grading will include shaping the channel bottom by excavating a thalweg and pools, per the dimensions specified in the DRAWINGS. The excavated material will then be placed and graded into slightly elevated areas adjacent to the thalweg in the form of bars and other natural variation in the channel bed. The placed material will then be track packed. This process is repeated until design depths and shaping are achieved.

5. Fine grading is often concurrent with the construction of riffle structures and placement of habitat boulders (separate pay items). Most of this work is performed by utilizing an excavator equipped with a thumb and assisted by either a second excavator, loader, tracked skid steer or small dozer. Graded channel elements shall be directed and approved by the ENGINEER.

F. Channel Bed Material Remove, Stockpile & Reuse

1. Channel Bed Remove and Reuse shall include excavating Channel Bed Material where work is proposed, stockpiling it and reusing it in the proposed channel bed per the DRAWINGS.

2. For this PROJECT, Channel Bed Material shall be removed from a 35' wide and 0.5' deep area along the existing alignment of the fish passage channel, stockpiled and replaced in the pools and runs of the proposed fish passage channel or other disturbed channel bed areas.

3. Additional Channel Bed Material may be removed if it is within proposed work areas and meets material needs on the PROJECT.

4. CONTRACTOR shall make reasonable efforts to avoid excavating finer pockets of material with the Channel Bed Material and remove and replace finer material from the Channel Bed Material stockpile.

G. Boulder, Riprap, Rubble Material Remove, Stockpile & Reuse

1. CONTRACTOR shall remove boulders, riprap, and rubble within disturbance area, stockpiled and reused in the project area per the DRAWINGS or as directed by the ENGINEER.

20 SECTION 31 23 19 DEWATERING

Part 1 GENERAL Subsection 1.01 SECTION INCLUDES
ADD the following paragraphs after 1.01 A:

B. Dewatering temporary excavations shall be in accordance with Colorado Department of Health and Environment (CDPHE) and Division of Water Resources (DWR) dewatering regulations and Project and CONTRACTOR-received permits.

Part 2 PRODUCTS, Subsection 2.01 MATERIALS
REPLACE paragraph 2.01.A with the following paragraph:

A. The CONTRACTOR shall provide all required materials and equipment to facilitate dewatering. On-site materials meeting specifications may be used within the limits of construction to construct temporary dams and berms. Other materials such as plastic sheeting and sandbags may also be used if desired by the CONTRACTOR.

Part 3 EXECUTION, Subsection 3.01 GENERAL
REPLACE paragraph 3.01.G with the following paragraph:

G. All excavations made as part of dewatering operations shall be backfilled with the same type material as was removed, except where replacement by other materials and/or methods are required.

Part 3 EXECUTION, Subsection 3.02 CONSTRUCTION
REPLACE paragraphs 3.02.A.1 with the following:

1. Surface water control generally falls into the following categories:
   a. Normal low flows along St Vrain Creek;
   b. Storm/flood flows along St Vrain Creek;
   c. Flows from existing storm drain pipelines; and
   d. Local surface inflows not conveyed by pipelines.

Part 3 EXECUTION, Subsection 3.02 CONSTRUCTION
ADD the following paragraphs after 3.02.A.2.b:

c. The following is approximate storm flow data for St Vrain Creek, which is for information only. This information was obtained from St. Vrain Creek CHAMP model.

Design Point	**Design Storm Hydrology (Years)**		
	10	**25**	**100**
St Vrain Creek through Project Area	2,292 ft^3/sec	4,644 ft^3/sec	7,419 ft^3/sec

The 100-year flood flow of 7,419 cfs has a one percent probability of being equaled or exceeded in any given year.

Part 3 EXECUTION, Subsection 3.02 CONSTRUCTION
ADD the following paragraphs after 3.02.A.4

6. The CONTRACTOR has the option of completing instream channel elements while working in the live stream. Appropriate erosion control measures shall be employed when working in the live stream.

7. Existing trees and vegetation should be preserved as much as possible.

8. All grading and stabilization measures shall be complete before flow is reintroduced to the fish passage channel.

Part 3 EXECUTION, Subsection 3.02 CONSTRUCTION
ADD the following paragraphs after 3.02.B.2.a

b. Special Dewatering Provisions for Instream Structures: The CONTRACTOR shall isolate the work area from surface waters, and then drawdown the groundwater level to an elevation below subgrade in a manner which will prevent "quick" conditions. The dewatering operation will be continuous, 24 hours per day, until the affected portion of the stream work is complete, and the

groundwater level can be allowed to rise without endangering the stability of existing or new features.

c. The CONTRACTOR should anticipate that even with the groundwater level lowered below subgrade where subgrade features are to be placed, conditions will be moist and possibly soft and easily disturbed by activity. The CONTRACTOR is responsible to control such conditions and prevent loosening of the subgrade material and refrain from activities which would make the materials more permeable and/or inadequate to support the structure.

Part 3 EXECUTION, Subsection 3.02 CONSTRUCTION
ADD the following paragraphs after 3.02.B.4

1. Dewatering work for earthwork operations adjacent to or encroaching on, streams or water courses shall be conducted in a manner to prevent muddy water and eroded materials from entering the streams or water courses by construction of intercepting ditches, bypass channels, barriers, evaporation ponds, or by other approved means. Excavated materials or other construction materials shall not be stockpiled or deposited near or on streambanks, lake shorelines, or other water course perimeters where they can be washed away by high water or storm runoff or can in any way encroach upon the water course itself. Turbidity limits from the Dewatering Permit shall be followed, and all other relevant permit conditions.

21 SECTION 31 25 00 EROSION AND SEDIMENT CONTROLS

Part 1, Subsection 1.02 SECTION INCLUDES
REPLACE 1.02.A.4 with the following:

3. Section 207 TOPSOIL

22 SECTION 31 37 00 RIPRAP, BOULDERS, AND BEDDING

Part 1, Subsection 1.01 SECTION INCLUDES

REPLACE paragraph 1.01.A with the following:

A. The WORK includes excavation, grading, and installation of riprap, boulders, cobbles, channel bed material, soil riprap, void-filled riprap, bedding, riffles, and habitat boulders placed at the locations shown on the DRAWINGS. The materials to be used and the construction of such structures shall be as specified herein.

Part 2, Subsection 2.01 MATERIALS
ADD the following paragraphs after 2.01 F:

G. COBBLES:

1. Cobble used shall be the type designated on the DRAWINGS and shall conform to Table 1: Riprap Gradations.

2. Gradation:

a. Each load of riprap shall be reasonably well graded from the smallest to the largest size specified.

b. Stones smaller than the two to ten percent (2 to 10%) size will not be permitted in an amount exceeding ten percent (10%) by weight of each load.

c. Control of gradation shall be by visual inspection. However, in the event ENGINEER determines the cobble to be unacceptable, ENGINEER shall pick two (2) random truckloads to be dumped and checked for gradation.

d. Mechanical equipment and labor needed to assist in checking gradation shall be provided by CONTRACTOR at no additional cost.

3. Imported cobble color shall be consistent with existing rock at the PROJECT site.

4. Stone shall be hard, durable, resistant to weathering and to water action, and free from overburden, spoil, shale, structural defects, and organic material.

5. Neither breadth nor thickness of a single stone shall be less than one-third its length.

6. Cobble for use in-channel features shall be rounded to subrounded, and diameters as specified in the DRAWINGS (measured on the secondary axis, or B-axis).

7. A portion of cobbles, boulders and rocks for use in the channel features shall be salvaged during construction activities from areas with high cobble or channel bed material density that will be disturbed as part of construction activities as approved by the ENGINEER. The CONTRACTOR may not remove cobbles from areas where work was previously completed or which will not be disturbed as a part of the proposed DRAWINGS.

Part 3, Subsection 3.02 PLACEMENT

REPLACE paragraph 3.01.A with the following:

A. Channel slope, bottom, or other areas that are to be protected with riprap, boulders, cobble, soil riprap, void-filled riprap or riffles shall be free of brush, trees, stumps, and other objectional material and be graded to a smooth compacted surface as shown on the DRAWINGS.

ADD the following paragraphs after 3.02 E:

F. HABITAT BOULDERS:

1. Habitat boulders shall be constructed of boulders and dimensions shall adhere to those specified in the DRAWINGS. Boulders in habitat boulders shall be rounded to sub-rounded and color shall be consistent with rock found on the PROJECT site.

2. Habitat boulders shall be placed at the direction of the ENGINEER in the field. The CONTRACTOR may be required to reposition or adjust the installation as directed in the field by the ENGINEER.

3. Boulders will be machine-placed and then arranged as necessary by use of an excavator with a multi-prong grappling device. Habitat boulders shall be placed to minimize voids and gaps of 4” or greater shall be chinked with cobble to ensure a property interlocked system.

4. Boulders shall be buried in the channel bed substrate, or bank if relevant, 1/3 to 2/3 of the boulder diameter. If substrate is not sufficiently coarse, a footer boulder shall be installed below the habitat boulder.

G. RIFFLES:

1. Materials and dimensions of the riffle shall adhere to those specified in the DRAWINGS and may include riprap, cobble, boulders, void-filled riprap and/or bedding depending on the riffle feature. When riffles are to be constructed of void-filled riprap it shall be installed in accordance with void-filled riprap installation specified in Section 31 37 00 3.02.D.

2. Arrangement of rock within each feature and spacing between channel features will be as shown on the DRAWINGS. The CONTRACTOR may be required to reposition or adjust the installation as directed in the field by the ENGINEER.

3. Rock shall be placed to minimize voids and form a smooth surface as directed by ENGINEER. This may require placing rock in multiple lifts, and backfilling voids with native streambed material, unless otherwise specified on the DRAWINGS. For rock structures that involve placement of boulder mix material, dumping and backhoe placement alone is not sufficient to ensure a properly interlocked system. Boulders may be machine-placed and then arranged as necessary by use of an excavator with a multi-prong grappling device or by hand to interlock and form a substantial bond.

4. Rock shall be placed and distributed such that there shall be no large accumulations of either the larger or smaller sizes of stone.

5. The CONTRACTOR is responsible for protection and maintenance of the rock structures including all individual elements during construction and until final acceptance of the work. Disturbance of adjacent, previously-constructed work shall be repaired by the CONTRACTOR at the CONTRACTOR's expense.

6. Any dewatering required during construction shall follow the approved construction dewatering permit requirements and/or water control plan per Section 31 23 19 DEWATERING.

7. Installation of riffles may require concurrent installation of other features such as habitat boulders or woody features which are paid for separately and shall be installed according to Sections 31 37 00 and/or 13 40 01.

00 73 90: Permits

Unless otherwise specified, the CONTRACTOR shall procure or ensure that all required permits and licenses are acquired; pay all charges, fees, and taxes, including permits procured for this project by others; and give all notices necessary and incidental to the due and lawful prosecution of the work. The costs of these permits will not be paid for separately, but shall be included in the work.

Prior to beginning work, the CONTRACTOR shall furnish the ENGINEER with a written list of all permits required for the proper completion of the CONTRACT. The list shall clearly identify the types of permits that must be obtained before work on any particular phase or phases of work can be started. Copies of the fully executed permits shall be furnished to the ENGINEER upon request. Below is a list of some applicable permits for this project. This list is not all inclusive and should be compared to list developed by CONTRACTOR.

OWNER and the ENGINEER will support the CONTRACTOR in applying for permits required as part of this project. Permits are in various stages of process and CONTRACTOR can obtain permit-related information from OWNER. Permits that are required are:

1. Boulder County Community Planning & Permitting (CP&P) Department Traffic Control Plan and Transportation Management Plan
2. Boulder County Stream Restoration Permit (A combined Boulder County Grading Permit and Boulder County Floodplain Development Permit).
3. Boulder County Department of Public Works Right of Way Permit
4. Boulder County MS4 permit: Storm Water Quality Permit
5. Colorado Department of Transportation Right of Way Permit
6. Stormwater Discharge Permit Colorado Department of Public Health and Environment (CDPHE)
7. Construction Dewatering Wastewater Discharge Permit CDPHE
8. State Department of Revenue Tax Exempt Permit
9. Boulder County Oversize/Overweight permit (if applicable)

CONTRACTOR shall verify all appropriate permits have been acquired and transferred to their name, as applicable, prior to starting any work. CONTRACTOR must meet conditions and requirements of all permits acquired for this project.

OWNER and ENGINEER will obtain the following permits or clearances:

1. US Army Corps Clean Water Act Section 404 Nationwide Permit 27
2. Boulder County CP&P Department Limited Impact Special Use Permit (subject to CONTRACTOR permit commitments)
3. Section 7 – Endangered Species Act: US Fish and Wildlife Service (USFWS)
4. Environmental Assessment
5. Colorado Parks and Wildlife - SB40 Review
6. BNSF Temporary Access for ENGINEER Survey Personnel

The CONTRACTOR and OWNER shall collaborate to obtain the Boulder County Stream Restoration Permit. A Boulder County Floodplain Development Permit has already been applied for by OWNER/ENGINEER. CONTRACTOR shall address remaining requirements of the Boulder County Stream Restoration Permit and Boulder County Limited Impact Special Use Permit including grading permit, erosion control, traffic control/management plan, haul routes, stream access routes, Boulder County Oversize/Overweight permit (if applicable), and all other necessary information required by OWNER to obtain permit approvals.

Some clearances have been developed by the ENGINEER and OWNER, but will need to be verified by CONTRACTOR prior to starting any work. Some clearances require review of the work area prior to start of work by a qualified individual. Please review requirements in this document for specifics. CONTRACTOR must meet requirements of all clearances acquired for this project.

All WORK must be performed in accordance with all attached regulatory permits. CONTRACTOR is responsible for obtaining any additional federal, state, and local permits as necessary.

01. **USACE 404 Permit.** OWNER has applied for and received authorization from the USACE with a Section 404 Permit for this WORK. A copy of this permit is made part of this WORK. **CONTRACTOR must have a copy of this permit on SITE at all times.** Full compliance with the terms of all permits is required. CONTRACTOR shall comply with all permit provisions and be fully responsible for any violations of any permit condition.

02. **General Permit for Stormwater Discharges Associated with Construction Activity and Boulder County Stormwater Quality Permit.** An example of a Stormwater Management Plan (SWMP) will be provided after the Notice of Award. The CONTRACTOR must submit an updated SWMP at the Pre-Construction Meeting.

    When a PROJECT is subject to a State of Colorado or Federal Stormwater Discharge Permit and a Boulder County Stormwater Quality Permit, it is CONTRACTOR's responsibility to obtain and comply with all the conditions stated in said permits. If CONTRACTOR anticipates, or if construction activities result in any change or noncompliance with conditions stated in the permits, then CONTRACTOR shall detail the anticipated changes or noncompliance in a written report to OWNER. The submission of the report will be within five (5) days from the time CONTRACTOR becomes aware of change or noncompliance. Within ten (10) days after receipt of the report, OWNER shall approve or disapprove the request for change, or detail the course of action after noncompliance.

    CONTRACTOR will be held responsible and liable for any legal action taken against CONTRACTOR or OWNER due to CONTRACTOR's noncompliance with any of the conditions stated in the Stormwater Discharge Permit and Stormwater Quality Permit. Such responsibility shall include the defense, indemnification and holding the OWNER and all its PROJECT partners harmless in regard to such noncompliance. CONTRACTOR shall be solely

and completely liable for all fines, fees and all other charges that are assessed against CONTRACTOR or OWNER and OWNER's PROJECT partners as a result of CONTRACTOR's noncompliance with the terms and conditions of the Stormwater Discharge Permit and Stormwater Quality Permit.

If a monetary fine is assessed against OWNER due to CONTRACTOR's noncompliance with any of the conditions stated in the Stormwater Discharge Permit or Stormwater Quality Permit, the fine will be subtracted from any money due to CONTRACTOR as set forth in Article 13 ADDITIONAL WITHHOLDING OF PROGRESS PAYMENTS. If such fine is in excess of all the money due to CONTRACTOR, then CONTRACTOR shall be liable and agrees to pay to OWNER the amount of such excess.

END OF SECTION

SECTION 00 73 91

SUPPLEMENTARY SPECIFICATIONS

The following specifications are added to the standard MHFD Technical Specifications, including multiple specifications from the CDOT standards.

SECTION 01 11 00 SUMMARY OF WORK

PART 1 GENERAL

1.01 SECTION INCLUDES

A. This section covers the WORK to be covered by the CONTRACT DOCUMENTS and requirements for the completion of the WORK.

1.02 WORK COVERED BY CONTRACT DOCUMENTS

A. The completed WORK will provide OWNER with the following:

1. Enhancements to St. Vrain Creek channel, riparian corridor, and adjacent uplands that were damaged during the September 2013 flood.

2. Restored aquatic and terrestrial wildlife habitat

3. Reduced risk of damage to adjacent irrigation headgates and BNSF Railroad embankment

4. Increase efficiency of delivery of decreed water right to adjacent headgates

B. CONTRACTOR shall obtain NOTICE TO PROCEED from OWNER approving WORK covered by CONTRACT DOCUMENTS prior to start of WORK.

1.03 WORK SEQUENCE

A. CONTRACTOR shall submit the WORK Sequence as part of the construction schedule required in SECTION 01 32 00, CONSTRUCTION PROGRESS DOCUMENTATION. Meetings and permitting activities may begin immediately on the date of NOTICE TO PROCEED or upon receipt of signed PRE-AUTHORIZATION OF WORK. Mobilization may begin in July 2020 when all permits have been received and appropriate notifications made. Clearing and grubbing activities may start August 3, 2020 or later with appropriate notification according to project permits.

PART 2 PRODUCTS (NOT APPLICABLE)

PART 3 EXECUTION (NOT APPLICABLE)

END OF SECTION

SECTION 01 18 00 PROJECT UTILITIES

PART 1 GENERAL

4.01 SECTION INCLUDES

A. A description of the process used to verify the presence and locations of underground utilities within the limits of construction and a list of the local utility providers.

PART 2 PRODUCTS (NOT APPLICABLE)

PART 3 EXECUTION

6.01 EXAMINATION

A. ENGINEER contacted 811 and completed a Utilities Locate with all Tier 1 and Tier 2 Providers. No Utilities were located within the limits of construction.

B. There may be private facilities within the WORK area. Private facilities are owned by the owner of the property and therefore are not marked. It is the responsibility of the CONTRACTOR to have private utilities marked.

C. Longmont Power and Communication (LPC) overground poles/lines are approximate when shown on the DRAWINGS.

D. CONTRACTOR shall notify ENGINEER immediately of any utility discrepancies.

E. CONTRACTOR shall inform ENGINEER of existing utility private utility installations or any installations that need relocation.

6.02 RELOCATION

A. If CONTRACTOR requests that utility companies relocate their utilities for CONTRACTOR's convenience in construction of any portion of the WORK, the cost of such shall be at CONTRACTOR's expense.

6.03 UTILITY IMPACTS

A. Where CONTRACTOR's operations may cause damage or inconvenience to railway, communications, telephone, television, oil, gas, electricity, water, sewer, irrigation, or any other utilities or services, CONTRACTOR's operations shall be suspended until all arrangements necessary for the protection of these utilities and services have been made by CONTRACTOR.

B. CONTRACTOR shall protect all utility poles from damage. If interfering utility poles, guy wires, or anchors are encountered, CONTRACTOR shall notify ENGINEER and the appropriate utility provider at least 48 hours in advance of construction operations to permit the necessary arrangements for protection or relocation of the interfering structure.

C. In the event of interruption to domestic water, sewer, storm drain, irrigation, or other utility services as a result of accidental breakage due to construction operations, CONTRACTOR shall promptly notify the utility provider, ENGINEER, and OWNER. CONTRACTOR shall cooperate with said provider in the restoration of service as promptly as possible and bear all costs of repair.

D. CONTRACTOR shall replace, at CONTRACTOR's sole expense, any and all other existing utilities or structures removed or damaged during construction, unless otherwise provided for in these CONTRACT DOCUMENTS or ordered by ENGINEER.

E. CONTRACT TIME will not be extended to account for repair of utilities damaged by CONTRACTOR's negligence.

F. CONTRACTOR shall be solely and directly responsible to the providers of such utilities and services for any damage, injury, expense, loss, inconvenience, delay, suits, actions, or claims of any character brought because of any injuries or damage, which may result from the construction operations under this CONTRACT.

G. Neither OWNER nor its officers or agents shall be responsible for damages as a result of CONTRACTOR's failure to protect utilities encountered in the WORK.

H. Full compensation for compliance and cooperation, as required by this section, is considered to be subsidiary to other WORK items and no additional compensation will be allowed.

6.04 UTILITY NOTIFICATION

A. Names and telephone numbers of agencies and utilities area are listed below for CONTRACTOR's convenience. CONTRACTOR assumes all responsibility for verification of telephone numbers.

TIER	AGENCY	UTILITY TYPE	PHONE
1	CENTURY LINK	FIBER, TELCO	888-450-4052
1	LONG'S PEAK WATER DIST	WATER	303-776-3847
1	NEXT LIGHT LONGMONT	FIBER	303-651-8386
1	TOWN OF LYONS	ELECTRIC, SEWER, WATER	303-823-6622
1	XCEL ENERGY	ELECTRIC & GAS	800-895-4999
1	XCEL ENERGY HI PRESSURE GAS	GAS PIPELINE	800-895-4999
1	CITY OF LONGMONT	ELECTRIC, WATER, TRAFFIC	303-651-8664
2	LONGMONT LOCATING		303-651-8416
2	LONGMONT SUPPLY DITCH COMPANY	DITCH	303-774-9981
2	CHAPMAN & MCCASLIN DITCH	DITCH	303-358-3211

SECTION 01 31 19 PROJECT MEETINGS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. This section covers the requirements for attendance at meetings needed for coordination of the PROJECT.

1.02 PRECONSTRUCTION CONFERENCE

A. A Pre-Authorization of Work agreement will be negotiated to allow work between the NOTICE OF AWARD and the NOTICE TO PROCEED.

B. A Pre-Construction Conference will be held after NOTICE OF AWARD and before the NOTICE TO PROCEED; the date, time, and location will be determined after NOTICE OF AWARD.

C. The conference shall be attended by:

1. CONTRACTOR and CONTRACTOR's Superintendent.

2. CONTRACTOR's SUBCONTRACTOR's Superintendent.

3. ENGINEER.

4. OWNER.

5. Others as requested by CONTRACTOR, OWNER, or ENGINEER.

D. Unless previously submitted to OWNER, CONTRACTOR shall bring the construction schedule, SHOP DRAWINGS, and other submittals required by the CONTRACT DOCUMENTS.

E. The purpose of the Pre-construction Conference is to designate responsible personnel and establish working relationships. Topics requiring coordination will be discussed and procedures for handling such matters established. The agenda will include, but not be limited to, discussion on:

1. CONTRACTOR's schedule.

2. Permit applications, including but not limited to, 401 Permit, Erosion and Sediment Control Plan, Erosion and Sediment Control Permits, Traffic Control Plan, Traffic Control Permits

3. Status of Bonds, insurance, and CONTRACT DOCUMENTS.

4. Transmittal, review, and distribution of CONTRACTOR's submittals.
5. Processing applications for payment.
6. Maintaining record documents.
7. Critical work sequencing.
8. Dewatering Plan, Water Control Plan, and Sheetpile Installation Plan.
9. Public Notice Process.
10. Davis-Bacon and related documentation
11. Utility Coordination and Schedule Impacts.
12. Suppliers and Subcontractors.
13. Vegetation installation standards and post-installation irrigation.
14. Surveying.
15. Material Testing.
16. Personnel Responsibilities and Communications.
17. Initial Traffic Control Plan to be submitted per Boulder County requirements.
18. Storm Water Management Plan (SWMP).
19. FIELD ORDERS, WORK CHANGE DIRECTIVES, and CHANGE ORDERS.
20. Use of premises, office and storage areas, staging area, security, housekeeping, and OWNER's needs.
21. Major product delivery and priorities.
22. CONTRACTOR's safety and first aid plan and representative.
23. Permit compliance not otherwise addressed above, not limited to MBTA compliance.

1.03 CONSTRUCTION PROGRESS MEETINGS

A. Progress meetings will be conducted weekly or at some other frequency, as determined by ENGINEER. These meetings shall be attended by OWNER, ENGINEER, CONTRACTOR's representative and any others invited by these people.

B. CONTRACTOR will conduct the meeting and arrange for keeping the minutes and distributing the minutes to all persons in attendance.

C. The agenda will include discussion on construction progress, schedule updates, the status of submittal reviews, the status of requests for information, critical work sequencing, review of strategies for connections into existing facilities, water accounting, status of FIELD ORDERS, WORK CHANGE DIRECTIVES, and CHANGE ORDERS, and any general business.

1.04 OTHER MEETINGS

A. In accordance with CONTRACT DOCUMENTS and as may be required by OWNER or ENGINEER.

PART 2 PRODUCTS (NOT APPLICABLE)

PART 3 EXECUTION (NOT APPLICABLE)

END OF SECTION

SECTION 01 55 26 TRAFFIC CONTROL

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Section covers requirements for traffic control during construction of the PROJECT.

1.02 REFERENCES

A. The following is a list of standards which may be referenced in this section:

1. AASHTO Guide for the Design of Bicycle Facilities, Current Edition.
2. AASHTO Roadside Design Guide, Current Edition.
3. American Traffic Safety Services Association (ATSSA).
4. Colorado Department of Transportation (CDOT), Standard Specifications for Road and Bridge Construction, Current Edition.
5. Federal Highway Administration. Standard Highway Signs.
6. NCHRP – Report 350 Recommended Procedures for the Safety Performance Evaluation of Highway Features.
7. U.S. Department of Transportation, Federal Highway Administration (USDOT): Manual of Uniform Traffic Control Devices (MUTCD).
8. U.S. Department of Transportation, Federal Highway Administration: Design Guidance: Accommodating Bicycle and Pedestrian Travel: A Recommended Approach.

1.03 SUBMITTALS

A. A Transportation Management Plan (TMP) and a Traffic Control Plan (TCP) will be developed by the CONTRACTOR in accordance with guidance provided in CONTRACT DOCUMENTS.

At the pre-construction meeting, the CONTRACTOR shall submit a digital copy and two (2) hard copies each of a Transportation Management Plan (TMP) and a Traffic Control Plan (TCP) to the ENGINEER. Do not begin construction on any given phase before receiving written acceptance of the TCP.

The TCP shall be completed by a certified Traffic Control Supervisor (TCS) employed by the CONTRACTOR or sub-contractor, and the Boulder County Public Works

Department, OWNER, and the ENGINEER will review and approve. The TCS shall refer to the transportation management plan when developing the traffic control plan. The traffic control plan shall be submitted at the pre-construction meeting and shall include all proposed haul routes for all materials coming to the project site and leaving the project site; all project access points, fueling locations, staging areas; intended internal circulation including stream access routes; construction sequencing (timing of hauling) and proposed truck traffic volumes per haul route. The TCP and haul plan will be reviewed by the Boulder County Community Planning & Permitting (CP&P) Development Review Coordinator, the Boulder County Department of Public Works, BCPOS Project Manager and the ENGINEER prior to the Stream Restoration permit submittal for final review, revision, and approval.

Components of the TCP shall include:

- Locations and types of warning signs along the roads shall be shown, including signage appropriate for bicycle traffic.
- Flaggers and all necessary traffic control devices including VMS and bicycle signage shall be supplied and/or installed and removed by the CONTRACTOR.
    - Flaggers and/or other traffic control measures may be required at the intersections of the access points to roadways and along off-site haul routes during hauling operations.
    - Variable Message Boards may be required along off-site haul routes during hauling operations, and shall be supplied and installed by the CONTRACTOR.
- The applicant shall coordinate with the Colorado Department of Transportation (CDOT) as needed. Contact Gloria Hice-Idler at CDOT (970-350-2148).
- Hours of hauling shall be from 8:30 AM to 4:30 PM, Monday through Friday, to limit impacts on regular vehicular traffic, especially during peak commuter periods.
- No heavy traffic or hauling past the elementary school on N.75th Street will be allowed.
- No left turns entering or exiting the Martin Marietta gate from State HWY 66 (Ute Highway) will be allowed.

B. Administrative Submittals: Copies of permits, licenses, and approvals for construction as required by Laws and Regulations and governing agencies.

1. CONTRACTOR shall be responsible for securing any necessary permits or approvals related to Traffic Control activities. Application for permits and

governing agency approvals shall only be made after acceptance of plan by OWNER.

C. Parking area plans.

D. Product Data: Warning signs and barricades.

1.04 VEHICULAR TRAFFIC

A. Traffic Control Plan:

1. If a Traffic Control Plan is provided in the PROJECT DOCUMENTATION it shall be used by CONTRACTOR as guideline only. The CONTRACTOR shall be responsible for the development and implementation of the Traffic Control Plan.

2. CONTRACTOR shall submit a Traffic Control Plan for approval by OWNER in accordance with the submittal requirements defined in these SPECIFICATIONS. Adjustments to the approved plan may be required by OWNER based on actual traffic operations. Changes to the plan shall only be made with the written approval of the OWNER.

PART 2 PRODUCTS

2.01 SAFETY DEVICES AND SYSTEMS

A. CONTRACTOR shall use devices and systems which meet NCHRP-350 Report crash test requirements as defined by the Federal Highway Administration unless exceptions are granted by the OWNER.

2.02 TRAFFIC CONTROL SIGNING AND DEVICES

A. Signs: Comply with the requirements of the Traffic Control Plan, other requirements defined in this section and any applicable requirements defined in the reference documents, including CDOT Standard Specifications.

B. Channelizing Devices:

1. Comply with the requirements of the Traffic Control Plan, other requirements defined in this section and any applicable requirements defined in the reference documents, including CDOT Standard Specifications.

2. Use construction orange tubular markers and cones during daylight hours only.

C. Barricades:

1. Comply with the requirements of the Traffic Control Plan, other requirements defined in this section and any applicable requirements defined in the reference documents, including CDOT Standard Specifications.

2. Do not use rocks, asphalt, or concrete pieces, construction materials, and other debris as weighting devices for barricades. Sand bags will be permitted as long as a low center of gravity is maintained as approved.

PART 3 EXECUTION

3.01 VEHICULAR TRAFFIC

A. CONTRACTOR shall:

1. Conform to the USDOT MUTCD or applicable statutory requirements of authority having jurisdiction and the accepted Traffic Control Plan.

2. Allow emergency vehicles immediate passage.

3. Recognize that OWNER requirements take precedence over the MUTCD. Operations on or about traffic areas and provisions for regulating traffic shall additionally be subject to the regulation of other governmental agencies having jurisdiction over the affected areas.

4. Keep traffic areas free of excavated material, construction equipment, pipe, and other materials and equipment.

5. Keep fire hydrants and water control valves free from obstruction and available for use at all times.

6. Conduct operations in a manner to avoid unnecessary interference with public and private roads and drives and provide and maintain temporary access for businesses and residences. Provide and maintain suitable and safe bridges, detours, or other temporary expedients for accommodation of public and private travel. When access to private driveways must be temporarily denied due to construction operations, notify the property owner or responsible party of such closure not less than 24 hours in advance of closure. Give notification in writing and include the estimated duration of the closure.

7. Minimum lane width shall be 10-feet, unless noted otherwise. Where cones are used to separate traffic lane from construction zone, do not use traffic lane for accessing construction zone, and do not store materials or equipment on or near shoulder of traffic lane side of roadway.

8. In making street crossings, do not block more than one-half the street at a time. Maintain one lane of traffic at all times. Ensure access for traffic in both directions.

9. Notify the fire department, police/sheriff department, highway patrol, ambulance service, local school district, and transit 14 days before closing roadway or portion thereof. Notify said departments or agencies when streets are again passable for vehicles. Conduct operations with the least interference to fire equipment access, and at no time prevent such access. Furnish CONTRACTOR's night emergency telephone numbers to the police or sheriff's department.

10. Pedestrian and bicycle access along sidewalks and streets will be kept open and safe from construction activities and traffic lanes.

11. Hours of hauling shall be from 8:30 AM to 4:00 PM to limit impacts on regular vehicular traffic, especially during peak commuter periods.

12. No haul vehicles allowed on N. 75th Street in the vicinity of the Hygiene Elementary School: use alternate routes including Airport Road and Hover Street.

B. Flaggers: May be required to provide for public safety or the regulation of traffic, or by jurisdictional authorities; and if used, shall be properly equipped and certified by ATSSA.

3.02 PROTECTION OF WORK AND PROPERTY

A. Warning Signs and Barricades:

1. Provide warning signs and barricades for the following:

2. Open trenches and other excavations.

3. Obstructions, such as material piles, equipment (moving or parked), and piled embankment.

4. Protection of roads and driveways.

5. Warning signs and barricades shall be illuminated by means of warning lights from sunset to sunrise.

3.03 PARKING

A. CONTRACTOR, with the approval of OWNER, shall designate parking areas for the use of all construction workers and others performing WORK or furnishing services in connection with the PROJECT so as avoid interference with public traffic, OWNER's operations, construction activities, or landowner activities.

3.04 ROADWAY USAGE BETWEEN OPERATIONS

A. At all times when WORK is not actually in progress, CONTRACTOR shall make passable and shall open to traffic such portions of the PROJECT and temporary roadways or portions thereof as may be agreed upon between CONTRACTOR and OWNER and all authorities having jurisdiction over any properties involved.

END OF SECTION

SECTION 240: PROTECTED PLANTS AND WILDLIFE CONSERVATION MEASURES

Section 240 is hereby added to the Standard Specifications for this project as follows:

PART 1 GENERAL

1.01 SECTION INCLUDES

A. This work consists of protecting migratory birds and other protected species during construction. This Section includes pertinent criteria relating to the:
   1. Endangered Species Act (ESA)
   2. Migratory Bird Treaty Act (MBTA)
   3. Bald and Golden Eagle Protection Act (BGEPA)
      a. Coordination with OWNER is critical and shall be implemented early in the construction process to limit or avoid construction delays.

      b. The reach of St. Vrain Creek encompassed in the project area is designated as a Mouse Management Area under the map of Preble's Meadow Jumping Mouse - Habitat Conservation Areas in the Boulder County Comprehensive Plan – Environmental Resources Element. Preble's meadow jumping mice (Preble's) are protected under the Endangered Species Act. (See Preble's Habitat Conservation Area map in Boulder County Comprehensive Plan Environmental Resources Element).

      c. Compliance with MBTA and the BGEPA is required. A known osprey nest exists just outside the project area and the recommended ½ mile buffer does NOT overlap this project area. However, haul routes and access points need to consider the location of this protective buffer. There are a number of historic raptors nests within the recommended ½ mile buffer of the project area. CPW recommended buffers shall be observed. The third-party Biologist Consultant will identify all nesting and roosting areas. If identified, CONTRACTOR must adhere to all CPW buffer recommendations

      d. Project Specifics (these dates supersede all other dates with regard to species and vegetation protection): Coordination with CPW on appropriate measures for protection of wildlife species is required.

         i. The Preble's active season is from May 1 through November 1.
         ii. Primary nesting season for migratory birds is from April 1st through July 31st.
         iii. Primary nesting season for nesting raptors is from February 1st through August 31st.
         iv. Primary nesting season for Bald and Golden eagles is from October 15th through July 31st and December 15th through July 15th, respectively.

      e. Refer to project-specific permits for details, some reminders are called out in this section. Conservation measures for plant and animal species protected under the Endangered Species Act (Preble's, Ute Ladies' Tresses Orchid, and Colorado Butterfly Plant) include:

i. Pre-Construction:
   1) Minimize footprint of disturbance by limiting access points, staging, etc.
   2) Locate access routes and haul routes in previously disturbed areas and existing roads.
   3) CONTRACTOR shall delineate areas of no entry for equipment on the ground with plastic construction fencing.
   4) CONTRACTOR and ENGINEER will debrief onsite personnel of limits of construction, construction fencing, limits of disturbance, no entry areas and other conservation pertinent measures.
   5) Follow stormwater guidelines and utilize control measures to limit sedimentation, contamination, erosion.

ii. Project Implementation:
   1) The CONTRACTOR shall contact the ENGINEER or OWNER to contact U.S. Fish & Wildlife Service (USFWS) if Preble's, Colorado Butterfly plant, or Ute Ladies' Tresses are found within project area.
   2) Limit disturbance (crushing) or removal of vegetation including willows, trees, shrubs, and herbaceous plants within riparian and adjacent upland habitat.
      (a) Limit disturbance to vegetation to the grading areas and staging areas as defined in the project plan set.
      (b) Choose equipment size/type appropriately to minimize disturbance and soil compaction.
   3) Stage, operate, locate and refuel equipment in designated approved areas outside of riparian habitat and immediately adjacent upland habitats.
      (a) Operate equipment from previously disturbed or modified roadbeds or shoulders above riparian, when possible.
      (b) Limit entrance and exit points in project area.
      (c) Stockpile topsoil and debris in designated approved areas outside of critical protected areas, and protect from stream flows.
   4) During Preble's active season (May 1-November 1), work only during daylight hours (Preble's are nocturnal).
   5) Promptly remove waste to minimize site disturbance and attraction of predators.
   6) Cover exposed holes or loose dirt with tarps/boards to prevent entrapment.
   7) Use control measures to limit construction disturbance.
      (a) Soil compaction: Establish one access route preferably along existing disturbed surface or route.
      (b) Soil compaction: Temporarily line access routes with geotextiles in wet, unstable soil.
      (c) Weed control: Wash and inspect vehicles and equipment per project requirements before entering or leaving project area.

(d) Weed control: Use only weed free certified materials, including gravel, sand, topsoil, mulch, and seed.

8) Complete construction in a given location before beginning restoration activities.

f. Migratory Bird Treaty Act (MBTA) and Bald and Golden Eagle Protection Act (BGEPA):

i. Migratory Birds: If work requiring ground disturbance and/or removal of woody and herbaceous vegetation occurs during the primary breeding season (April 1st through July 31st), pre-construction surveys, using accepted bird survey protocols, for nesting migratory birds must be completed within one week prior to commencement of work. It is the CONTRACTOR's responsibility to communicate their updated mobilization schedule with the BCPOS Project Manager to ensure that the qualified WILDLIFE BIOLOGIST from the Biologist Contractor has a minimum 2-weeks notice and can schedule pre-construction surveys one week prior to ground disturbance (Clearing and Grubbing currently estimated to be August 3, 2020).

ii. Raptors: If work occurs during the nesting season for raptors (February 1st through August 31st), pre-construction surveys for nesting raptors must be completed within one week prior to commencement of work. It is the CONTRACTOR's responsibility to communicate their updated mobilization schedule with the BCPOS Project Manager to ensure that the qualified WILDLIFE BIOLOGIST from the Biologist Contractor has a minimum 2-weeks notice and can schedule pre-construction surveys within one week of the CONTRACTOR's scheduled mobilization date.

If nesting raptors are discovered during construction, CONTRACTOR will abide by the Colorado Parks and Wildlife Recommended Buffer Zones and Seasonal Restrictions for Colorado Raptors https://cpw.state.co.us/Documents/WildlifeSpecies/LivingWithWildlife/RaptorBufferGuidelines2008.pdf). Notification must be provided by the CONTRACTOR to OWNER to receive guidance.

iii. Eagles: Bald and golden eagles are protected under the BGEPA. The project area is just outside the Colorado Parks and Wildlife ½ mile recommended buffer zone of a known bald eagle nest. If work occurs during the nesting period for bald eagles (October 15th through July 31st) and construction activities (including mobilization and hauling of material) encroach on the ½ mile buffer, PRIOR to initiating work, the CONTRACTOR must coordinate with the Colorado Parks and Wildlife Bird Conservation Coordinator (Liza Rossi – 970.871.2861) and the U.S. Fish and Wildlife Service (303-236-4773) to receive guidance.

Although there are currently no known bald eagle nests within one mile of the project site, bald eagles have historically nested in this area. If a bald eagle chooses to nest within one half mile of the project area between October 15th and July 31st, all work within the ½ mile buffer zone of the nest must stop and notification must be provided to OWNER (BCPOS Project Manager and BCPOS Wildlife Specialist) and third party Biologist Contractor. The OWNER will notify in turn appropriate entities including the Colorado Parks and Wildlife Bird Conservation Coordinator and the U.S. Fish and Wildlife to receive guidance.

1.02 MATERIALS AND CONSTRUCTION REQUIREMENTS

A. The CONTRACTOR shall schedule clearing and grubbing operations, earth work, soil disturbance and work on structures (hereinafter "Construction Activities") to avoid taking (pursue, hunt, take, capture or kill; attempt to take, capture, kill or possess) and minimize disturbance to migratory birds protected by the Migratory Bird Treaty Act (MBTA) or other protected species.

1. To protect migratory birds, the CONTRACTOR will take the following actions prior to commencement of construction activities:

a. *Nest Surveys*. The CONTRACTOR shall notify the ENGINEER and OWNER at least ten working days (two weeks) prior to the start of construction activities. During the active nesting season, a survey for active nests shall be conducted by a third-party Biologist Contractor (qualified WILDLIFE BIOLOGIST), contracted separately through OWNER, within the seven days immediately prior to the commencement of construction and prior to each construction phase of the project.

The WILDLIFE BIOLOGIST shall survey the area-of-disturbance and a 50-foot buffer around the area-of-disturbance for each area and/or phase of the project for active bird nests in all bird nesting habitat types. If the status of a nest (active/inactive) cannot be readily determined, the WILDLIFE BIOLOGIST shall monitor the nest up to three separate occasion, with at least three and no more than seven days between monitoring events. After three negative surveys, a nest shall be deemed inactive.

The WILDLIFE BIOLOGIST shall conduct raptor nest surveys within 0.5 mile of the area-of-disturbance within the seven days immediately prior to the commencement of construction activities and prior to each construction phase. If construction activities are located within the Colorado Parks and Wildlife (CPW) recommended buffer zone for specific raptors, "NO WORK" zones shall be established around active nest sites during construction according to the CPW standards or as recommended by the WILDLIFE BIOLOGIST in consultation with CPW. The "NO WORK" zone shall be marked with either fencing or signing. Work shall not proceed within a "NO WORK" zone until the WILDLIFE BIOLOGIST has determined that

the young have fledged or the nest is unoccupied. Coordination with OWNER and CPW on appropriate measures for protection for raptor nest sites is required.

b. *Vegetation Removal and Trimming (including trees, shrubs, and other vegetation).* When possible, vegetation shall be cleared prior to the time when active nests are present. Vegetation removal activities shall be timed to avoid the migratory bird breeding season, when possible.

c. *Grasses and Other Vegetation Management*. The undisturbed ground cover to 50 feet beyond the area-of-disturbance, or to limits of construction, whichever is less, shall be maintained at a height of 6 inches or less beginning April 1 and continuing until August 31 or until the end of ground disturbance work, whichever comes first.

d. *Work*. The CONTRACTOR shall prosecute work in a manner that does not result in a taking of migratory birds protected by the MBTA. The CONTRACTOR shall not prosecute work during the primary breeding season, April 1 through August 31, unless the following actions are taken:

i. During the time that the birds are trying to build or occupy their nests, between April 1 and August 31, the CONTRACTOR shall monitor the work areas at least once every three days for any nesting activity and consult with the OWNER if found.

ii. If the birds have started to build any nests, they shall be removed before the nest is completed. Water shall not be used to remove the nests if nests are located within 50 feet of any surface waters. Consult OWNER prior to any removal activities.

iii. Installation of netting may be used to prevent nest building. The netting shall be monitored and repaired or replaced as needed. Netting shall consist of a mesh with openings that are ¾ inch by ¾ inch or less.

If an active nest becomes established, (i.e., there are eggs or young in the nest), all work that could result in abandonment or destruction of the nest shall be avoided until the young have fledged or the nest is unoccupied as determined by the WILDLIFE BIOLOGIST and approved by the ENGINEER. The CONTRACTOR shall prevent construction activity from displacing birds after they have laid their eggs and before the young have fledged.

When work is complete, the CONTRACTOR shall remove and properly dispose of netting used in work areas.

2. *If Active Nests are Discovered*: If active nests containing eggs or young birds are found within the survey area, an appropriate buffer of 50 feet will be established around the nest by the WILDLIFE BIOLOGIST. This buffer dimension may be changed if determined appropriate by the WILDLIFE BIOLOGIST and approved by the ENGINEER and BCPOS Wildlife Biologist. The CONTRACTOR shall install fence (plastic) at the perimeter of the buffer. The CONTRACTOR shall avoid all active migratory bird nests. The CONTRACTOR shall avoid the area within 50 feet of the active nests or the area within the distance recommended by the

WILDLIFE BIOLOGIST until all nests within that area have become inactive. Work shall not proceed within the buffer until the young have fledged or the nests have become inactive.

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

Inactive nest removal and other necessary measures shall be incorporated into the work as follows:

3. *If inactive nests are discovered*:

   a. Inactive nests outside the limits of ground disturbance and vegetation removal shall be left in place.

   b. Inactive nests shall not be monitored.

4. *Taking of a Migratory Bird.* The taking of a migratory bird shall be reported to the ENGINEER and BCPOS Wildlife Biologist. The CONTRACTOR shall be responsible for all penalties levied by the U. S. Fish and Wildlife Service (USFWS) for the taking of a migratory bird.

END OF SECTION

SECTION 13 40 01 WOOD FEATURES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. This work consists of tree removal for use in wood features, woody materials preparation, over excavation, installation of large and small woody material and fill of excavations as indicated in the DRAWINGS.

1.02 RELATED SECTIONS

A. The following is a list of SPECFICATIONS which may be related to this section:

a. Section 31 11 00, Clearing and Grubbing

b. Section 31 23 00, Excavation and Fill

c. Section 31 37 00, Riprap, Boulders, Soil Riprap, and Bedding

d. Section 215 Transplanting

1.03 DEFINITIONS

A. Diameter at breast height (DBH) is the measurement of the diameter of a tree 4.5 feet from the top of the rootwad or large end of the log if no rootwad is present.

B. Large wood material (LWM) are individual trees or tree trunks, preferentially sourced with intact root mass, used to develop in-stream and floodplain large wood structures with a minimum DBH of 1 foot.

C. Large wood structures consist of structures constructed of multiple large wood material elements that have a minimum DBH of 1 foot, ballast boulders, and small wood material (less than 6” diameter)

D. Small wood features consist of structures constructed of either single or multiple small wood elements that have a maximum diameter 0.5’.

E. Rootwad or habitat logs are features that consist of a single or double large wood elements that have a minimum DBH of 1 foot.

1.04 QUALITY ASSURANCE

A. CONTRACTOR shall verify that any LWM delivered to the placement site meets the applicable quality, size, type, and number of elements presented in the DRAWINGS. Verification of materials sourced within Project limits shall be by visual inspection of quality and by measurement of trunk length/diameter.

B. Rejected materials shall be transported off-site and disposed of at CONTRACTOR expense outside of Project limits in an approved disposal location.

C. CONTRACTOR shall verify that LWM has been placed to lines and grades indicated in DRAWINGS. Verification shall be by visual inspection and survey of grade if specific elevations are identified on the DRAWINGS.

D. CONTRACTOR shall verify LWM count. Verification shall be by visual inspection. Elements not visible shall be counted prior to burial. LWM count of any individual installation shall not vary from the counts presented in the DRAWINGS unless specified by the ENGINEER.

E. Placed LWM count for the PROJECT shall not be less than 95% of total presented in the DRAWINGS and shall not exceed the total presented in DRAWINGS without approval of the ENGINEER.

PART 2 PRODUCTS

2.01 MATERIALS

A. The CONTRACTOR shall take care to protect the rootwads and branches from damage during handling and installation of LWM. LWM that breaks and becomes unusable or that is broken and unusable will be disposed of by CONTRACTOR in approved manner or utilized on site at ENGINEER’s discretion.

B. LWM elements shall not be hollow nor rotten, and shall include bark. If approved by ENGINEER in field, LWM shall be limbed to a limb length no more than 24”. LWM for construction shall be measured as follows:

1. LWM Length: Measurement shall include total length of log, including root wad, if present. Length of LWM shall be as specified on DRAWINGS, unless approved by the ENGINEER in the field.

C. Many LWM elements are required to have rootwads intact, as specified on DRAWINGS. Unless otherwise approved by the ENGINEER, the rootwads shall have a diameter that is between 3 and 4 times the DBH of the attached tree.

D. All LWM shall be sourced from native tree species. Non-native tree species, such as Elm, that do not sprout new trees must be approved by the OWNER. Any LWM sourced from outside the Project boundaries shall be certified disease- and parasitic insect-free by a qualified Forester and shall be approved by the ENGINEER prior to use. LWM shall be free of cracks, decay, or other structural deficiencies. Slow decaying wood species, such as conifers, are preferred to the extent feasible.

E. Ballast boulders shall meet the material requirements specified in Section 31 37 00 RIPRAP, BOULDERS, SOIL RIPRAP, AND BEDDING. Ballast soil material shall be native fill consisting of coarse sediment and a lesser amount of finer material.

F. Small wood elements shall be salvaged from onsite materials, either from clearing and grubbing activities or from ENGINEER-approved limbing of LWM salvaged from onsite trees that are removed.

G. Small wood elements may be shrubs, provided that they are from native plant species, or small branches from native tree species or non-native tree species, such as Elm, that do not sprout new trees. Shrub material shall be between 3 to 5 feet high and in diameter. Small branches shall be between 3 to 8 feet in length and 0.25 to 0.5 feet in diameter.

PART 3 EXECUTION

3.01 TREE REMOVAL

A. Trees removed for the wood features will fall into one of the following categories:

1. Marked trees measured to have a DBH greater than 1 foot at 4.5 feet above ground surface will be salvaged with rootwad intact for use in the Rootwad Features proposed for this project. Desired rootwad width is 3 to 4 times the DBH of the tree. Salvaged trees will have a minimum length of 20 feet and, if approved by ENGINEER, will be limbed to a limb length of no more than 24 inches. Longer trees will not be shortened to less than 35 feet without the approval of the ENGINEER. Exceptions to salvage rootwad trees are those trees that are not in locations accessible with an excavator, or trees that have root systems growing out of rock.
2. Trees less than 0.5 feet DBH are not designated for reuse as key logs in Rootwad Feature, but may be used for Small Wood Features, floodplain habitat, or chipped onsite as directed by ENGINEER or BCPOS Project Manager. To be used for Small Wood Features, the pieces must be 3 to 8 feet in length and 0.25 to 0.5 feet in diameter.

B. CONTRACTOR shall take care to protect the intact rootwads and limbs, if present, from damage during tree removal, handling, stockpiling, and eventual installation in wood features.

C. Native woody material will be re-used to the extent possible on-site. Trees, branches, and rootwads that are not re-used in project elements shall be chipped and spread onsite at the

direction of the ENGINEER in the field per Section 31 11 00 CLEARING AND GRUBBING.

3.02 LARGE WOOD STRUCTURE AND ROOTWADS

A. Place LWM as specified and indicated in the DRAWINGS.

B. The CONTRACTOR shall immediately notify the ENGINEER if a specified log size is not available.

C. The location, number of logs, and configuration of large wood structures may vary in field due to site conditions, and the final location of these structures will be approved by the ENGINEER in the field prior to construction. After construction, final number of large wood features installed shall be totaled for payment.

D. Material of large wood structures minimum diameter but shorter than minimum specified length shall not be included in final element count for payment, but shall be retained and used on-site for feature enhancement as directed by the ENGINEER.

E. Burial depth/length shall be a minimum of 1/3-2/3 of total log length. A log with an orientation angle of 0 degrees shall be placed parallel to the bank, and a log with a 90-degree orientation shall be placed perpendicular to the bank. Orientation of logs shall be within 10 degrees of the specified orientation angle, unless approved by the ENGINEER in the field.

F. Large wood shall be secured in placement locations by designated anchoring method listed on the DRAWINGS, unless otherwise approved by the ENGINEER in the field.

G. Salvaged slash woody material and transplanted willows may be used to fill void spaces between logs within each large wood structure as directed by the ENGINEER and as materials are available. The material shall be salvaged in accordance to Section 31 11 00 CLEARING AND GRUBBING and Section 215 TRANSPLANTING.

H. Trench widths associated with log installation shall be limited to the log diameter plus 2 feet, and the CONTRACTOR shall take care to minimize bank disturbance. Following construction, the CONTRACTOR shall stabilize any disturbed banks using methods noted on the DRAWINGS.

3.03 SMALL WOOD FEATURES

A. Placement of small wood features will be done at the direction of the ENGINEER in the field based on the total volume designated in the construction quantities and the material available from on-site salvage and limbing of removed trees.

B. Placement of small wood features may be done in the floodplain or in the channel and may be installed in conjunction with grading of other features to avoid disturbing completed work.

C. Installation will include excavating a trench for the designated wood, placing wood pieces, pinning the pieces with boulders was needed and re-covering the trench to match surrounding finished surfaces. The trench shall be minimally sized for the small wood pieces designated to avoid disturbing any more are than necessary.

D. Burial depth/length shall be a minimum of 1/3-2/3 of total shrub diameter or branch length unless otherwise specified by the ENGINEER.

END OF SECTION

SECTION 13 50 01 STOP LOG BAYS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Stop log bays compose the northern 1/3rd of the bypass structure, which consists of the stacked and grouted boulder portion of the bypass structure that surround the openings through the sheet pile wall, the stop log frame, guides, and catwalk support.

B. The stop logs and bays shall be constructed dimensionally as shown on the DRAWINGS concerning size, hardware number, type and location.

1.02 RELATED SECTIONS

A. The following is a list of SPECIFICATIONS which may be related to this section:

1. Section 31 23 00 Excavation and Fill
2. Section 31 37 00 Riprap, Boulders, and Bedding
3. Section 31 37 19 Grouted Boulders, Stacked Grouted Boulders, and Grouted Boulder Retaining Walls
4. Section 31 62 16 Steel Sheet Piles

PART 2 PRODUCTS

1.1 MATERIALS

A. STOP LOG FRAME, GUIDES, AND CATWALK SUPPORTS

1. The “c-channel” stop log frame, “angle iron” guides, and catwalk supports shall consist of rigid sub-units composed of galvanized ASTM A36 steel construction that shall be mechanically assembled and welded to form a single rigid unit at installation.

2. The “c-channel” stop log frame shall be welded to the edges of the sheet pile openings and the “angle iron” guides welded inside the vertical “c-channel” frame. A flush-bottom invert member shall be welded between vertical frames and over the sheet pile invert. Mounting style shall be as shown on the DRAWINGS.

3. Catwalk supports shall be constructed and welded outside the frames as shown on the DRAWINGS.

4. All welds shall be performed by welders with American Welding Society (AWS) certification. CONTRACTOR shall submit certifications prior to welding.

B. STOP LOG SEALS

1. Stop logs, frames, and guides will not be fitted with seals at this time. It is assumed that leakage through and around the stop logs will be minimal, as approved by ENGINEER.

2. If significant leakage occurs, stop logs shall be fitted with a resilient seal on both vertical edges and the bottom edge, or can be fitted with a seal along the bottom edge and have the vertical seals fitted to the frame. Seals shall be mechanically attached or mechanically retained to the stop log or stop log frame and shall have features that are enhanced by water head and log weight. If stop log seals are necessary, a method statement shall be submitted for approval prior to installing seals; all costs required for sealing stop logs shall be borne by the CONTRACTOR.

C. EQUIPMENT

1. Stop log bays shall be constructed using an excavator with a hydraulic thumb to assist with precise placement of boulders.

2. Sheet pile shall be installed, cut, and welded using equipment specified in Section 31 62 16 Steel Sheet Piles. All welds shall be performed by welders with AWS certification.

D. STOP LOGS

1. Stop logs shall be constructed of wooden, construction grade, pressure treated, 2x4 boards. These boards will be cut to the appropriate length to slide into the stop log frame and result in minimal leakage around the board. Each cut end of the stop logs shall be treated with a wood preservative, product shall be submitted to the ENGINEER for approval prior to application. Wood preservative shall be applied per the approved manufacturers procedures. Stop logs shall not require additional weighting to seat properly and shall seat properly regardless of stacking order.

E. GROUT

1. Grout shall meet the requirements of Section 31 37 19 Grouted Boulders, Stacked Grouted Boulders, and Grouted Boulder Retaining Walls.
2. Grout washout area shall be installed, maintained, and removed in accordance with CDPHE construction stormwater permit.

F. BEDDING MATERIAL

1. Bedding and backfill material for this item shall be (the same as the channel bed material per Section 31 23 00 EXCAVATION AND FILL). Slag or recycled aggregate will be rejected.

G. BOULDERS

1. Boulders shall conform to the dimensions specified on the DRAWINGS and in Section 31 37 00 Riprap, Boulders, and Bedding.

2. Boulders surrounding the stop log bays shall be shaped, cubed, boulders that are hard, durable, resistant to weathering and to water action, free from overburden, spoil, shale, structural defects, cracks, and organic material, and shall meet the size class specified. Neither breadth nor thickness of a single stone shall be less than one-third its length. Slag or recycled aggregate will be rejected.

3. The limits of the stacked and grouted cubed boulders shall conform to the limits specified on the DRAWINGS.

4. Boulders and rocks for use in the channel features can be salvaged during construction activities per requirements in Section 31 23 00 Excavation and Fill and as approved by the ENGINEER and/or OWNER'S representative. The CONTRACTOR may not remove boulders from existing bank stabilization measures unless approved by the ENGINEER in the field.

H. SHEET PILE
1. Sheet piles will be installed according to Section 31 62 16 Steel Sheet Piles. All welds shall be performed by welders with AWS certification.

PART 3 EXECUTION

A. Sheet pile and sill plate opening invert shall be within +0.05 feet, but -0.00 feet vertically.
B. Placement of boulders for stop log bays should start at the center of the openings in the sheet pile and proceed outward to the banks. Boulders should be fitted securely into the zig-zag pattern of the sheet pile. Place footing boulders on top of bedding material, and then header boulders up to the sill invert. Check the elevations of the inverts to within 0.1 feet. Boulder placement shall conform to SECTION 31 37 19, Subsection 3.01 for Stacked Grouted Boulders.
C. Once the stop log bay inverts have been established, the remainder of the footing, header, and surface boulders shall be placed tightly against each other, minimizing voids. All surface boulders shall be offset from the footing boulders a minimum of 1/3 width of the footing boulder.

END OF SECTION

REVISION OF SECTION 207 - TOPSOIL

Section 207 of the CDOT (2019) Standard Specification is hereby revised as follows:
Subsection 207.01, shall include the following:

All topsoil shall be either secured from the site or supplemented with Proganics Biotic Soil Media. It shall also include the placing of topsoil upon constructed cut and fill slopes after grading operations are completed and prior to seeding. Proganics Biotic Soil Media applied at a rate of 4000 lb/ac is equivalent to 4” of topsoil.

Subsection 207.02 shall include the following:

Topsoil and/or Proganics Biotic Soil Media (if topsoil depth is insufficient) shall be a minimum thickness of 6" placed to final grade or as directed by the ENGINEER or VEGETATION SPECIALIST and approved by BCPOS Vegetation Specialist.

Topsoil and/or seeding surfaces shall be amended as per Section 212 – Seeding, Fertilizer and Soil Conditioner to obtain the above qualities, including the addition of other soil conditioners.

Subsection 207.03, paragraph two, shall include the following:

Topsoil Removal: After the construction area and its access have been delineated, the vegetation should be mowed to a maximum height of four (4) inches over the area to be disturbed. If the amount of vegetation exceeds what can be incorporated into the soil without interfering with establishing a proper seedbed, then excess vegetation shall be removed.

Topsoil should be removed by a front-end loader (preferred method) or grader. **Under no circumstances should upland topsoil be removed under wet soil moisture conditions**. The depth of the topsoil layer may vary. Topsoil may be delineated from the subsoil by a higher organic matter content (usually, but not always, indicated by a darker color) **and** a relatively loose and friable soil structure. Typically, topsoil is between four (4) and eight (8) inches in depth.

Under no circumstances shall subsoil be mixed with topsoil, and subsoil shall not be placed on top of the topsoil. If necessary, salvaged topsoil shall be cordoned off to delineate the topsoil from subsoil or other materials. The topsoil shall be protected from contamination by subsoil material, weeds, etc. and from compaction by construction equipment and vehicles.

Relieving Compaction: Areas to receive topsoil that have been compacted by heavy equipment or chronic traffic shall be ripped or chiseled **prior to redistribution of topsoil.** Construction areas and other compacted areas will be chiseled to a minimum depth of 12 inches, with no more than a 10-inch interval between chiseled furrows. Two passes with a chiseler may be necessary, with the second pass chiseling between the first furrows, or perpendicular to original furrows.

Subsection 207.03, paragraph four, shall include the following:

Redistribution of Topsoil and Application of Soil Conditioning: The topsoil should be redistributed uniformly over the disturbed areas, minimizing compaction by equipment. **Topsoil redistribution shall not occur under wet soil conditions**. Topsoil shall be ripped again after it is placed as

specified above in the paragraph "Relieving Compaction" if compaction has occurred during topsoil redistribution. See Specification 212 for Seeding, Fertilizer, Soil Conditioning, and Sodding application. Topsoil conditioning shall be incorporated evenly throughout the topsoil.

END OF SECTION

SECTION 212 SEEDING, FERTILIZER, SOIL CONDITIONER, AND SODDING

Section 212 of the CDOT (2019) Standard Specification is hereby revised as follows:

DESCRIPTION

Delete subsection 212.01 and replace with the following:

This work consists of soil preparation, application of fertilizer, soil conditioners, or both, and furnishing and placing seed. The work shall be in accordance with the CONTRACT and accepted horticultural practices.

MATERIALS

Subsection 212.02 (a) Seed shall include the following:

Maximum crop and weed content shall follow the Colorado Seed Certification Standards for certified seed:

Prohibited noxious weeds	None
Restricted noxious weeds	Less than 0.1%
Total other crop seed	Less than 1.0%

Seed shall be free of prohibited noxious weeds including, but not limited to: Canada thistle, diffuse knapweed, spotted knapweed, Russian knapweed, field bindweed, hoary cress, jointed goat grass, leafy spurge, musk thistle and yellow toadflax.

The OWNER shall furnish to the CONTRACTOR a signed statement certifying from supplier that the seed is from a lot that has been tested by a recognized laboratory for seed testing within thirteen months prior to the date of seeding. In addition, seed shall be free from cheatgrass (*Bromus japonicus* and *Bromus tectorum*).

The OWNER shall furnish all copies of seed tests for purity (inert matter, other crop, and weed seed) and germination for all seed lots for approval by the CONTRACTOR, ENGINEER and VEGETATION SPECIALIST. An All States Noxious Weed test will be required. Germination tests must be within twelve months prior to the date of seeding. Approved facilities for seed testing include official state seed laboratories in Arizona, California, Colorado, Idaho, Montana, Nevada, Oregon, South Dakota, North Dakota, Nebraska Crop Improvement, Utah, Washington, and Wyoming. Approved private Seed laboratories include the following: AV Seed Testing, Agri-Quality Testing, Inc., Agri-Seed Testing Services, Mid-West Seed Testing Services, Ransom Seed Laboratory, and J&T Green. The OWNER shall not use a seed lab with which they have close business connections, such as a financial interest, controlling interest, or associated interests.

The CONTRACTOR, ENGINEER and VEGETATION SPECIALIST reserves the right to refuse any seed lot with excessive weed seeds and non-native contaminant seed for all native seed mixes, and to

require the use of a different seed lot. The OWNER shall be responsible for replacing any refused seed at no additional cost to the project.

If specified type or variety of seed is not available, substitutions must be submitted by the OWNER and approved by the VEGETATION SPECIALIST.

Subsection 212.02 (b) 1 Fertilizer shall be amended to include the following:

Fertilizer shall be Sustain 3-6-3 with Mycorrhizae and Humates.

Subsection 212.02 (b) 2 Soil Conditioner, Compost paragraph shall be amended to include the following additional requirements:

Compost: Compost must be Class 1 weed-free and organic and shall not contain biosolids or tree wood.

Delete subsection 212.02 (c) Sod.

CONSTRUCTION REQUIREMENTS

Delete subsection 212.04 Lawn Grass Seeding

Delete subsection 212.05 Sodding

Delete subsection 212.06 (a) Soil Preparation and replace with the following:

(a) *Soil Preparation.* Disturbed areas shall be loosened to a minimum depth of 12-inches, with no more than a 10-inch interval between chiseled furrows. All slopes shall be left in a roughened condition. Uneven grading of the soil surface is acceptable and encouraged to prevent further compaction from excess heavy machinery operation. All slopes shall be free of concrete and asphalt. Slopes flatter than 2:1, shall be tilled into an even and loose seed bed 4-inches deep. Harrowing, disking, or other operation may be required to breakdown large soil clods greater than 4-inches in diameter and provide an acceptable seed bed. No soil preparation for seeding shall occur when soil is frozen or in an extreme wet or dry condition.

Slopes shall be free of soil clods, sticks, stones, and woody material in excess of 4-inches in any dimension, and be brought to the desired grade and line. Uneven grading of the soil surface is acceptable and encouraged to prevent further compaction from excess heavy machinery operation. All slopes shall be free of concrete and asphalt. No soil preparation for seeding shall occur when soil is frozen or in an extreme wet or dry condition.

Amend subsection 212.06 (b) Fertilizing and Soil Conditioning to include the following:

(b) *Soil Conditioning.* Prior to seeding, soil conditioner shall be applied evenly to the soil surface designated as Zones 2, 3, 4 and 5 on the DRAWINGS. The following amendments shall be applied at the following rates to all Zones:

1. Imported Topsoil Replacement - Proganics Biotic Soil Media as needed to supplement any topsoil of insufficient depth. Proganics Biotic Soil Media applied at a rate of 4000 lb/ac is equivalent to 4-inches of topsoil.

2. Fertilizer – Sustane 3-7-2 Organic Fertilizer with Mycorrhizae and Humates Sustane 3-7-2 Organic Fertilizer at the manufacturers recommended rate or at the direction of the ENGINEER to Zones 3, 4 and 5 as shown on the Drawings, only in locations where Proganics Biotic Soil Media was NOT applied.

The following amendments shall be applied at the following rate in Zone 2:

3a. Compost – OWNER approved A-1 Organics Biocomp (or equivalent), Class 1 Compost 6 CY / 1,000 sq. ft.

The following amendment shall be applied at the following rate in all zones except Zone 2:

3b. Compost – OWNER approved A-1 Organics Biocomp (or equivalent), Class 1 Compost 3 CY / 1,000 sq. ft.

All conditioners shall be thoroughly mixed into the topsoil.

Delete subsection 212.06 (c) and replace with the following:

(b) *Seeding*. Seeding shall be accomplished within 24 hours of tilling or scarifying to make special seed bed preparation unnecessary. The seeding application rate shall be as designated in the CONTRACT documents. All slopes flatter than 2:1 shall be seeded with grass or no-till drills followed by packer wheels. Drag chains are not allowed. Drills shall have depth bands set to maintain a planting depth between ½ and ¾ inch and shall be set to space the rows not more than seven (7) inches apart. Packer wheels that firm the soil over the drill row are required. Seed that is extremely small shall be sowed from a separate hopper adjusted to the proper rate of application. The CONTRACTOR shall notify the ENGINEER and VEGETATION SPECIALIST and BCPOS Vegetation Specialist 24 hours in advance and request inspection of seeding areas prior to installation.

Seed drills must be clean of seed from previous seeding jobs before any seeding begins.

If strips greater than seven (7) inches between the rows have been left unplanted or other areas skipped, the ENGINEER or VEGETATION SPECIALIST or BCPOS Vegetation Specialist will require additional seeding at the CONTRACTOR's expense.

When requested by the CONTRACTOR and approved by the ENGINEER, VEGETATION SPECIALIST, and BCPOS Vegetation Specialist, seeding may need to be accomplished by broadcasting in Zones 2, 3, 4 and 5 at twice the rate specified in the CONTRACT documents at no additional cost to the project.

All seed sown by broadcast-type seeders shall be "raked in" or covered with soil to a depth of at least ¼ inch. Broadcasting seed will be permitted only on small areas not accessible to machine methods or areas too rocky to use a seed drill. Broadcast seeding shall proceed on freshly disturbed (raked or harrowed) soil surface and broadcast seed shall be immediately raked or harrowed into the surface. Raking shall be accomplished using metal-tined garden or landscape rakes; no plastic leaf rakes shall be allowed. If harrowing is used, an English harrow or its equivalent shall be required.

Multiple seeding operations shall be performed as portions of job are completed to take advantage of

growing conditions and to comply with Section 31 25 00 and subsection 212.03.

1. Seeding (Upland and Riparian) – Prior to seeding, the soil conditioner shall be applied at the rates indicated above and incorporated into the entire depth profile of the topsoil or 6”, whichever is greater.

Seed shall be applied at the percent of mix (% of mix) and application rate (PLS/Acre) that is designated on the seed schedules under Upland and Riparian Seeding. Seed shall be applied to Planting Zones 3, 4 and 5 areas shown on DRAWINGS.

2. Seeding (Wetland) - Seed shall be applied at the percent of mix (% of mix) and application rate (PLS/Acre) that is designated on the seed schedules under Wetland Seeding. Seed shall be applied to Planting Zone 2 areas shown on DRAWINGS.

All seeding shall occur with OWNER approval (as long as the ground is not frozen or too wet). ENGINEER, VEGETATION SPECIALIST, and BCPOS Vegetation Specialist shall approve the onsite conditions are suitable for seeding prior to seeding. Irrigation Plan shall be ready to implement at the time of seeding.

END OF SECTION

SECTION 213 MULCHING

Section 213 of the CDOT (2019) Standard Specifications is hereby revised for this project as follows:

DESCRIPTION

Subsection 213.01 shall include the following:

This work includes furnishing and applying spray-on mulch blanket for reclamation of disturbed areas as approved and inspected by the VEGETATION SPECIALIST and OWNER; and wood chip mulch for tree and shrub planting.

MATERIALS

Subsection 213.02, shall be amended as follows:

Delete subsection 213.02 (a) Mulching

Delete subsection 213.02 (b) Wood Cellulose Fiber Mulch

Modify subsection 213.02 (d) Wood Chip Mulch as follows:

(d) Wood Chip Mulch. Materials for mulching trees and shrubs shall be wood chips or approved equivalent. The CONTRACTOR shall submit a sample for the approval at least 30 days prior to placing on the project.

Delete subsection 213.02 (e) Metal Landscape Border

Replace subsection 213.02 (f) Spray on Mulch Blanket with the following:

(f) Spray-on Mulch Blanket. Spray on mulch blanket shall consist of the following:

(1) Spray-on Mulch Blanket (Type 1) shall be a hydraulically applied matrix containing organic fibers, water soluble cross-linked tackifier, reinforcing natural and/or synthetic interlocking fibers. Mulch Blanket (Type 1) shall conform to the following:

Properties	Requirement	Test Method
Organic Fibers	71% Min.	ASTM D 2974
Cross linked Tackifiers	10% +/- 2% Min.	
Reinforcing Interlocking Fibers	10% +/- 1% Min.	
Biodegradability	100%	ASTM D 5338
Ground Cover @ Application Rate	90% Min.	ASTM D 6567
Functional Longevity	12 Months Min.	
Cure Time	< 8 hours	
Application		
Application Rate	3000 lbs./acre	

The organic fiber shall not contain lead paint, printing ink, varnish, petroleum products, seed germination inhibitors, or chlorine bleach. The organic fibers and reinforcing interlocking fibers cannot be produced from sawdust, cardboard, paper or paper by-products.

Delete subsection 213.02 (g) Bonded Fiber Matrices (BFM)

CONSTRUCTION REQUIREMENTS

Subsection 213.03, delete subsections (a), (c), (f) and (h).

Subsection 213.03 (b) Hydraulic Mulching shall include the following:

Spray-on Mulch Blanket shall be applied to all seeding areas after seeding. No work shall occur when soil is extremely wet.

Subsection 213.03 (b) shall delete the fourth paragraph and replace with the following:

Apply hydromulch and tackifier mixtures at the following rates:

Wood Cellulose
3000 lbs./Acre

Fiber Mulch Tackifier
150 lbs./Acre

Modify subsection 213.03 (e) Wood Chip Mulch as follows:

(e) Wood Chip Mulch. A 2- to 3-inch layer, unless otherwise shown in the DRAWINGS, of wood chip mulch shall be placed in all tree and shrub saucers. Wood chip mulch shall be capable of matting together to resist scattering by the wind.

Delete subsection 213.03 (f) Metal Landscape Border

Delete subsection 213.03 (g) Spray on Mulch Blanket and replace with the following:

(g) Spray-on Mulch Blanket. No chemical additives with the exception of fertilizer and bio nutrients will be permitted as described in section 212. Apply Spray-on mulch blanket in a uniform application using a 50-degree fan tip nozzle. Apply hydro slurry in two directions (for example, from top of slope down and from toe of the slope up, where feasible, providing application at a minimum of two layers). Apply Spray-on Mulch Blanket to achieve 100% soil surface coverage at an average and uniform depth of 3 mm. Dilution rate of 100 gallons of water/50-pound bale. Flexterra HP Flex Growth Medium (FGM) or EcoFlex HP FGM or approved equal at dilution rate of 125-gallons water/50-pound bale may be substituted with prior approval by BCPOS Vegetation Specialist and VEGETATION SPECIALIST. Water should be added and product should be mixed for the time specified by the manufacturer. Infiltration time must be allowed for between passes depending on ambient soil moisture and pre-treatment infiltration rates.

Hydro mulching vessel shall be filled with water to at least 1/3 capacity (high enough to cover agitators) prior to adding any material. Continue to fill vessel with water and slowly add the fibers while agitators are in motion. Run agitators at ¾ speed. Continue to mix tank per manufacturer's specifications prior to application.

END OF SECTION

SECTION 214 PLANTING

Section 214 of the CDOT (2019) Standard Specifications is hereby revised for this project as follows:

DESCRIPTION

Delete Subsection 214.01, and replace with the following:

This work consists of furnishing and planting potted trees and shrubs, willow cuttings and riparian and wetland tree/shrub clump transplants. Riparian and wetland tree/shrub clump harvest and transplants will come from onsite sources designated by the VEGETATION SPECIALIST, ENGINEER, and/or BCPOS Vegetation Specialist during construction. Willow cuttings may come from onsite or offsite sources and planted in moist areas as shown on the DRAWINGS or as directed. Offsite sources will be identified and harvested by the CONTRACTOR.

MATERIALS

Subsection 214.02 General shall include the following:

CONTRACTOR is responsible for obtaining plant materials. Plant material, with the exception of willow cuttings and wetland tree/shrub clump transplants, shall be procured from a licensed, qualified and competitive nursery facility specializing in the production of native plant materials, or from the willow cutting and wetland tree/shrub clump collection areas as designated below. All plant material shall be "ecotypic" which is defined for this specification as native to the northern Colorado Front Range and Boulder County.

Plants shall be of the species, variety, and quantities designated on the Plant Schedules. All plants shall be in healthy condition with normal well developed branch and root systems, free from disease, harmful insects and insect eggs, sun-scald injury, disfigurement or abrasion; and shall conform to the requirements of the current "American Standard for Nursery Stock." The CONTRACTOR shall obtain certificates of inspection of plant materials that are required by Federal, State, or local laws, and submit the certificates to BCPOS Vegetation Specialist and VEGETATION SPECIALIST.

Plant material shall be kept shaded, watered, and maintained in good health during transport. All plant materials shall be covered during transport to avoid desiccation and damage to the branches, trunk, root systems, or root ball. Branches shall be protected by tying-in.

Upon delivery, the CONTRACTOR shall count and confirm the plant delivery is accurate compared to the plant quantities in the CONTRACT. Plant material shall be staged by species in separate and identifiable groups during unloading. BCPOS Vegetation Specialist and/or VEGETATION SPECIALIST shall inspect all plant material to ensure it is in good condition and health prior to accepting delivery of plant materials. OWNER-provided painted bamboo stakes shall be installed in

each container to designate species (put the stake in the container in the staging area, if possible, and transport them to the project area that way for accurate marking during planting).

Plant materials shall be stored and protected in a designated temporary on-site nursery area. If over the course of the project the VEGETATION SPECIALIST or BCPOS Vegetation Specialist discovers the CONTRACTOR has failed to properly store, install and maintain any previously accepted plant material, said material will be removed and replaced with acceptable material at the expense of the CONTRACTOR.

Substitutions will not be permitted without written request and approval from the BCPOS Vegetation Specialist and VEGETATION SPECIALIST. Before any substitution of plants will be considered, the CONTRACTOR shall furnish to the BCPOS Vegetation Specialist and the VEGETATION SPECIALIST written statements from three sources verifying that the plants designated on the DRAWINGS are not available. All substitutions must represent native species that are "ecotypic" as defined above and appropriate for the elevation where the plant material will be planted.

BCPOS Vegetation Specialist or VEGETATION SPECIALIST may reject any nursery stock not meeting the CONTRACT at any of the following times and locations:

(1) At the named supplier's location. BCPOS Vegetation Specialist or VEGETATION SPECIALIST will notify the CONTRACTOR when nursery stock will be inspected at the supplier's location, if applicable.

(2) On the project site at the time of delivery, prior to planting.

(3) On the project site following delivery and prior to planting (while stored in the temporary on-site nursery area).

(4) At the time of installation. Final acceptance of all plant material will be made at the time of installation on the project site.

Delete subsection 214.02 (a), and replace with the following:

(a) *Willow cuttings*. Willow cuttings shall be collected in areas within 1,000 vertical feet of elevation, and of similar hydrology to those existing at the planting site as directed by BCPOS Vegetation Specialist and/or VEGETATION SPECIALIST. If willow cuttings are purchased, they should follow the same collection procedures as much as possible and their source shall be approved by the BCPOS Vegetation Specialist.

No more than 20 percent of middle age plant material shall be taken from willow collection sites unless plant will be removed or transplanted during excavation and grading. Written consent from the property owner must be received in areas where harvesting will occur, and will specify if it is beneficial to take more than 20 percent of the plant material.

Willows shall be cut by hand. Transport of willow cuttings on the collection site may be by hand or machinery. No machinery will be used on any property without consent of the owner. Written consent of the owner including explanation of machinery type and limits of machinery travel shall be provided to the ENGINEER before machinery is used for willow transport.

All Willow Cuttings will be harvested while dormant, stripped of all branches. Willow cuttings taken from designated plants shall be at least 3/4" inch in diameter or larger at the narrow end. Willow cuttings shall be 48 inches long with the bottom end cut off at a 45-degree angle and the top end with a straight cut. The cuttings will be placed into water within one hour of cutting and then placed in cold storage on the same day as harvesting. Cuttings shall be kept hydrated during cold storage until time of planting. Willow cuttings shall be cold stored, but no longer than 6 months. Prior to planting cuttings shall be soaked at a water depth of one (1) foot for 5-7 days prior to planting. Water shall be free from any harmful oil, chemical, sprays, or other materials. Cuttings shall be maintained in a shaded, moist, and cool condition from the time of harvest through the time of installation, including during transportation and upon delivery to the site. The cuttings will be kept wet until placed into the ground and will not be allowed out of water for more than 30 minutes during planting.

The collection team will be aware of all property lines and maintain cutting practices on lands that have provided consent only. Collections made on public lands must be permitted and carried out in accordance with local, state, and federal law. Willow cuttings grown in an approved nursery will be allowed.

Willow collection sites shall be left in good condition following the collection process. All slash will be removed and disposed of as part of the work in an approved manner or left in habitat piles.

The CONTRACTOR shall provide the ENGINEER and VEGETATION SPECIALIST and BCPOS Vegetation Specialist two weeks' notice prior to beginning willow collection.

Delete subsection 214.02 (b) Wetland Perennial Plants.

Modify Subsection 214.02 (d) Soil Conditioners and Fertilizer as follows

(d) *Soil Conditioners and Fertilizer*. Potted trees and shrubs shall be fertilized at their source according to standard nursery practice.

Add Subsection 214.02 (e) Riparian and Wetland Tree/Shrub Clump Transplants (Clumps)

(e) *Riparian and Wetland Tree/Shrub Clump Transplants (Clumps*). Clumps shall be harvested while dormant (if feasible, depending on project schedule) from locations identified by the BCPOS Vegetation Specialist and/or VEGETATION SPECIALIST and immediately planted in locations designated by the VEGETATION SPECIALIST and pursuant to Section 215 if feasible. The exact quantity and species of Clumps that can be harvested and transplanted has not been surveyed. The quantities of Clumps as indicated on the bid schedules has been estimated as 1 Clump per 100 square feet of the identified wetland impact areas. The quantity of viable clumps may vary according to in-field conditions. If direct transplant of Clumps is not feasible, then the Clumps shall be healed in straw or soil and watered at a local Staging Area to minimize transport and disturbance of the integrity of the clump. Exact locations and elevations for individual Mature Willows shall be field located by VEGETATION SPECIALIST or BCPOS Vegetation Specialist. Refer to Riparian & Wetland

Tree/Shrub Clump Transplant Detail and Tree Planting Detail.

Add Subsection 214.02 (f) *Potted trees and shrubs.* Potted trees and shrubs shall be in the size and form indicated on the plant schedules using containers used in standard nursery practice. Each species shall be identified by means of grower's label affixed to the plant. Label shall be waterproof labels and use weather-resistant ink. The grower's label shall include the source, correct scientific and common name.

Add Subsection 214.02 (g) *Wildlife depredation*. Vole Protection Fence shall be installed around all cottonwoods, chokecherry and plum by OWNER after the Letter of Final Acceptance has been sent to the CONTRACTOR.

Vole Protection Fence shall be caged with galvanized steep hardware cloth to prevent small mammal herbivory. Hardware cloth shall have no more than 1/2" size openings. Each fence shall be cut to one foot (1') high and 12" in diameter capable completely encircling the base of the plant with space allowing for three years growth. Caging shall be secured to the ground with 3 equidistantly spaced 12" long landscape staples. Caging shall be level with the ground such that small mammals cannot get underneath. Hardware cloth shall be secured above ground with zip ties, cable ties or galvanized wire.

Add Subsection 214.02 (h) *Backfill*. Backfill soil for potted trees and shrubs shall be composed of 50 percent native soil and 50% topsoil as specified in Section 207. If native soil is greater than 50 percent rock, then topsoil shall be used.

CONSTRUCTION REQUIREMENTS

Subsection 214.03 (a) Planting Seasons shall include the following:

(a) Planting Seasons. Plants shall be planted in accordance with the CONTRACT.

Areas to be planted shall be brought to the lines and grades designated or approved. The location of plants shown in the CONTRACT is approximate to the degree that unsuitable planting locations shall be avoided.

Locations and layouts of potted trees and shrubs shall be conducted by the VEGETATION SPECIALIST or BCPOS Vegetation Specialist before installation. Locations and layouts of willow cutting and clump installation shall be laid out, in areas shown on DRAWINGS and pursuant to the Willow Cutting detail, by the CONTRACTOR or BCPOS Vegetation Specialist using stakes, pin flags or ground marking paint and then final locations and elevations for willow cuttings and clumps approved by the VEGETATION SPECIALIST or BCPOS Vegetation Specialist before planting holes are prepared.

Subsection 214.03 (b) Excavation shall include the following:

(b) Excavation. Planting pits shall be circular in outline with vertical or sloped sides. Pits for trees and shrubs shall be at least two times greater in diameter than the earth ball.

Soil excavated from the plant pit will be handled deliberately to form the plant saucer and will not be carelessly wasted or cover existing vegetation or seeded areas. When inter-planting in existing, mature grassland or wetland, excavated soil will be placed on a tarp or similar to avoid indiscriminate spoils from burying adjacent, on existing vegetation. Excess soil excavated from the plant pit that is not used to form the saucer shall be removed from the site and disposed of by the CONTRACTOR at sites/locations approved by the VEGETATION SPECIALIST or BCPOS Vegetation Specialist.

Replace Subsection 214.03 (c) Planting as follows:

(c) Planting. Planting shall be done in accordance with good horticultural practices. Plants of upright growth shall be set with stem plumb/upright and plants of prostrate type shall be set with the stem at right angles or normal to the ground surface and growth parallel to the ground surface. Plants with dry, broken, or crumbling roots will not be accepted for planting.

Planting. Planting pits shall be dug so that the top of the rootball is level with the final grade. The tree rootball shall be set in the center of the planting pit on undisturbed soil. Trees shall be stabilized and then the wire basket, any twine or wire, and burlap shall be removed before the pit is backfilled. Shrubs shall be planted in the center of the pit. Plastic, metal, fabric, or peat containers shall be removed. Shallow scores ¼ to ½ inch deep shall be made along the edges of the rootball if root-bound.

Subsection 214.03 (d) shall include the following:

(d) *Backfilling*. Backfill shall be thoroughly mixed with native soil and worked and watered-in to eliminate air pockets. Watering shall be done immediately after the plant is placed. Backfilling of the planting pit shall be resumed after this water is absorbed. Roots and root crown shall be covered with soil at this time. After the soil has settled, plants must be in the proper position and at the proper depth. Saucers shall be prepared around each plant to the dimensions shown on the planting details using material excavated from the pit. Saucers shall be covered with a 1- to 2-inch thick layer of fresh moist wood chip mulch conforming to Section 213. After completion of all planting and before acceptance of the work, the CONTRACTOR shall water plants installed under this CONTRACT, as needed to maintain a moist root zone optimum for plant growth. Plants damaged by the CONTRACTOR's operations shall be replaced at the CONTRACTOR's expense.

Subsection 214.03 (e) shall include the following:

(e) Pruning. All deciduous trees and shrubs shall be pruned (if necessary) in accordance with standard horticultural practice, preserving the natural character of the plant. Guidelines for pruning are indicated in the planting details. Pruning cuts shall be made with sharp clean tools. Clippings from pruning may be evenly distributed on site or shall become the property of the CONTRACTOR and be removed from the site.

Delete subsection 214.03 (f) Staking.

Delete subsection 214.03 (g) and replace with the following:

(g) *Willow Cuttings.* Cuttings shall not be planted when the ground is frozen. Only the number of willow cuttings that can be planted in one day will be removed from storage and delivered to the planting site. Failure to properly store and hydrate willow cuttings or if cuttings linger on site more than 2 days before planting will be replaced by the CONTRACTOR at the CONTRACTOR's expense if said cuttings fail to thrive.

Willow Cuttings shall be planted in areas shown on DRAWINGS and pursuant to the Willow Cutting detail. Final locations and elevations for Willow Cuttings shall be approved by VEGETATION SPECIALIST or BCPOS Vegetation Specialist prior to installation.

Using a rock bar, mechanical stinger, hammer drill, or other tool, holes at least 42 inches deep shall be made in the streambank or other designated planting areas on the DRAWINGS. The cuttings shall be planted by inserting angled end first into the ground a minimum of 42 inches extending 6-8 inches into the water table or capillary fringe. If in riprap, the hole shall be backfilled with soil to within 3 inches of the riprap surface. The top 3 inches of the void shall be filled with gravel/sand from the streambank or streambed and compacted slightly. All cuttings will be trimmed after installation to ensure that no more than 6 inches and no fewer than 3 to 4 live buds are left above ground. Care will be taken to avoid damage to buds during handling. Bark must not be separated from the cambium layer.

The placement of these cuttings shall be in areas shown on the DRAWINGS that remain damp, seasonally inundated, or where subsurface alluvial interflow is within 36 of the surface, or as directed. Willow cuttings shall be planted at a density and/or spacing specified on the plant schedules on streambank or other designated areas.

Water shall be applied to the willow cutting planted areas at the time of installation until the soil mass is saturated. Willow cuttings shall be watered thoroughly as per 214.04 (b) 1.

Delete subsection 214.03 (i) and replace with the following:

(i) Irrigation. Plants shall be watered within 15 minutes of initial planting and watered thereafter, until final acceptance in the landscape maintenance / warranty period, according to the watering rates specified in Section 214.04 (b) 1.

LANDSCAPE ESTABLISHMENT

Section 214.04 shall include the following:

From the time of installation, during construction, and throughout the CONTRACT period the CONTRACTOR shall maintain all plant material and seeded areas in a healthy and vigorous growing condition, and ensure the successful establishment of vegetation. Performance criteria will be assessed according to the CONTRACT by the VEGETATION SPECIALIST and BCPOS Vegetation Specialist. This includes performing establishment, replacement work, watering, and warranty work as described below.

The beginning of the 1-year warranty period depends upon receipt of the written Letter of Final Acceptance of the Project from OWNER. The Letter of Final Acceptance depends in part on the date when all plant materials in the CONTRACT have been planted and all work under Sections 212, 213, 214, 215 and 623 has been performed and accepted, except for the Section 214 pay item, Landscape Maintenance. After the Letter of Final Acceptance is issued, the Warranty period begins immediately and lasts for a period of 12 months.

Section 214.04 (a) shall include the following:

(a) *Establishment and Replacement*. After all planting on the project is complete, a plant inspection shall be held including the CONTRACTOR, VEGETATION SPECIALIST, and BCPOS Vegetation Specialist to determine acceptability of plant material according to performance criteria stated in the CONTRACT. During the inspection, an inventory of rejected material will be made, and corrective and necessary cleanup measures will be determined.

Dead, dying, or rejected material shall be removed each month during the Warranty period as directed. Plant replacement shall be performed during the spring planting seasons. Plant replacement stock shall be planted in accordance with the CONTRACT and is subject to all requirements specified for the original material. Plant replacement shall be at the CONTRACTOR's expense.

Subsection 214.04 (b) shall include the following:

(b) Landscape Maintenance. During the Warranty period the CONTRACTOR shall perform landscape maintenance as described herein. The CONTRACTOR shall maintain all landscaped areas in the condition they were in when first installed and accepted.

Prior to the Letter of Final Acceptance, the CONTRACTOR shall submit a detailed landscape maintenance plan which includes a schedule showing the number of hours or days personnel will be present, the type of work to be performed, supervision, equipment and supplies to be used, emergency program and responsible person to contact for emergency work, and inspection schedule. The detailed landscape maintenance plan is subject to review and approval by BCPOS Vegetation Specialist. OWNER will not issue the Letter of Final Acceptance until the ENGINEER and BCPOS Vegetation Specialist have received and approved the landscape maintenance plan.

The proposed types, brand names, material safety data sheets, and rates of application of herbicides, pesticides, and fertilizers to be used shall be submitted for approval with the detailed landscape maintenance plan. Herbicides, pesticides, and fertilizers shall meet all local, state, and federal regulations and shall be applied by a licensed applicator.

The CONTRACTOR shall perform start-up, watering, programming, operation, and fall winterization of an irrigation system, if specified in the landscape maintenance plan. The CONTRACTOR shall do a spring start-up of the irrigation system and perform all irrigation system warranty work as specified in Section 623.

The CONTRACTOR shall keep a project diary documenting all landscape/irrigation maintenance activities including work locations, time spent and observations of the health of trees/shrubs and reporting to the VEGETATION SPECIALIST and BCPOS Vegetation Specialist if any evidence of damage is noticed. The CONTRACTOR shall provide copies of the diary to the ENGINEER and OWNER upon request.

The CONTRACTOR shall restore and reseed eroded areas and areas of poor establishment in accordance with Sections 212 and 213.

During the warranty period, the CONTRACTOR shall water, cultivate, and prune the plants as required or directed by the BCPOS Vegetation Specialist. The CONTRACTOR shall reshape plant saucers, repair washouts and gullies, replace lost wood chip mulch, keep all planting sites free from weeds and do other work necessary to maintain the plants in a healthy and vigorous growing condition. This includes seasonal spraying or deep root watering with approved insecticides or fungicides as required.

Subsections 214.04 (b) 1. and 214.04 (b) 2. Shall be deleted and replaced with the following:

1. **Watering**. Every effort has been made in the development of the planting plans to specify species and locate plants in zones and niches that will be naturally sustained by surface and/or alluvial subsurface flow. However, run-off and precipitation, either in the form of rain or snow, cannot be guaranteed. Therefore, watering shall be provided to ensure plant survival of installed plants including seeded areas through the periods of construction installation and watering, the warranty determination of survival and replacement needs according to performance criteria, and the replacement activities during the warranty period (1 year after date of the letter of final acceptance).

All plant material specified shall be watered by the CONTRACTOR by hand, hose, bucket, portable or fixed pump, water tank or truck, temporary irrigation system (overhead spray and/or drip), or other effective method or watering device as determined by the CONTRACTOR and approved by the OWNER.

CONTRACTOR shall be responsible for acquisition of water (cost, means, methods, delivery and accounting of the water) for construction, vegetation installation, and warranty watering purposes. All water leases and use will be vetted through the BCPOS Water Resources Specialist.

Starting with initial watering at the time of installation, and until final acceptance at the end of the warranty period including watering for the installation of new live plants to meet warranty requirements, the CONTRACTOR shall continue to water all plant materials according to the following general parameters:

(a) Trees & shrubs (including clump transplants)

Year 1 - Watering will need to occur on the following schedule from installation through the end of the warranty period:

- November - February: once every three weeks
- March - May: once every two weeks
- June - August: once every week
- September - October: once every two weeks

The CONTRACTOR shall diligently monitor the plants, soil moisture levels, and the amount of natural precipitation they are receiving. If trees & shrubs need to be watered more or less frequently than outlined above, the CONTRACTOR shall make adjustments to the schedule accordingly to ensure that the plants are watered appropriately.

(b) Willow Cuttings. Willow cuttings and transplants, if improperly installed (and thus not installed to the proper depth with naturally & persistently saturated soil) can be watered to completely saturate the soil to a minimum depth of 12" in accordance with the year 1 watering schedule for trees & shrubs. This is not a recommended method to replace proper installation methods but may be used to try to avoid the need to replace dead plant material at the end of the warranty period.

(c) Seeding Areas. Seeded areas may be irrigated with a temporary overhead irrigation and purchased water source. Irrigation water shall be applied using means and methods determined by the CONTRACTOR, in coordination with BCPOS Vegetation Specialist, at a frequency and time of day (early morning or late evening) to ensure that seedlings thrive. The duration of each irrigation session shall not produce gullies, rills or otherwise erode the soil.

Gully, rill and erosional areas caused by poorly managed irrigation will be repaired as necessary as per Section 212 until seeding areas have established and erosion problems cease. Erosion control blanket and/or fabric may need to be installed, reinstalled or repaired at the CONTRACTOR's expense.

2. Quantity of Water:

At each watering, woody plants shall receive the following minimum amounts of water based on container size or an amount sufficient to saturate the soil within the planting saucer to a minimum depth of 12 inches:

A. One-gallon sized containers shall receive 2.5 gallons

B. Riparian and Wetland Tree/Shrub Clump Transplants shall receive 25 gallons

Water shall be distributed evenly within the saucer and not breach or damage the saucer. Water shall be distributed evenly over seeded areas and clump transplants. Watering shall be accomplished without damage to existing or recently planted vegetation.

The CONTRACT performance bond shall guarantee replacement work during the warranty period.

If all other work is completed on a project, no CONTRACT time will be charged during the warranty period.

END OF SECTION

SECTION 215 TRANSPLANTING

Section 2l5 of the CDOT (2019) Standard Specifications is hereby revised for this project to include the following:

DESCRIPTION

This work consists of transplanting Riparian and Wetland Tree/Shrub Clumps (Clumps) in accordance with this specification and as directed by the VEGETATION SPECIALIST and/or BCPOS Vegetation Specialist. Clumps may include willow or other small trees or shrubs.

MATERIALS

Mature Clumps (consisting of willow, alder, birch, or cottonwood) shall be selected and flagged by the CONTRACTOR and approved by VEGETATION SPECIALIST and/or BCPOS Vegetation Specialist from plants presently growing within the Project limits of disturbance.

CONSTRUCTION REQUIREMENTS

Provisions of Specification 240, PROTECTED PLANTS AND WILDLIFE CONSERVATION MEASURES, shall be observed in the clearing, grubbing, or harvesting sites.

CONTRACTOR shall harvest Willow Cuttings from mature willow clumps in accordance with the requirements in section 214.03 Willow Cuttings.

The CONTRACTOR shall provide the ENGINEER, VEGETATION SPECIALIST, and BCPOS Vegetation Specialist two weeks' notice prior to clearing and grubbing or the harvesting of Clumps.

Clumps shall be harvested while dormant and immediately planted (if feasible) in locations identified by the VEGETATION SPECIALIST and/or BCPOS Vegetation Specialist. If direct transplant of Clumps is not feasible, then the Clumps shall be inserted in properly sized containers or balled and burlapped and healed in straw and/or straw/soil. Stored clumps shall be maintained and watered at an on-site staging area to minimize transport and disturbance of the integrity of the Clump. Transplant locations and elevations of individual Clumps relative to sustain water or saturated soil shall be field located by the VEGETATION SPECIALIST and/or BCPOS Vegetation Specialist.

Excavation of Clumps shall be performed with a tree-spade and shall fully capture the tap and fine roots of a Clump.

Clumps shall consist of one plant or a multi-stem plants harvested onsite and planted as directed by the VEGETATION SPECIALIST and/or BCPOS Vegetation Specialist. The Willow Clumps shall be planted according to the Riparian and Wetland Tree/Shrub Clump Transplant detail in the Revegetation

Plans. Tree Clumps shall be installed as per the planting details. Clumps shall be installed in locations that intersect the water table or capillary fringe.

A minimum of 6 inches of willow clump stems shall extend above the finished grade with no fewer than 3 to 4 live buds per plant stalk/branch left above ground. Care will be taken to avoid snapping stalks/branches or damaging the rootball during harvesting, transport, or transplanting.

CONTRACTOR shall backfill Clump transplants with a slurry of native bank or streambed material. Clumps shall be watered in so as that the ground is thoroughly saturated after following planting. No air pockets shall exist within or around the transplanted clump rootball after installation.

END OF SECTION

SECTION 216 SOIL RETENTION COVERING

Section 216 of the Standard Specifications is hereby revised for this project to include the following:

DESCRIPTION

Erosion Control Fabric (Coir) and Erosion Control Blanket (Straw-Coir) consists of furnishing, preparing, applying, placing and securing soil retention blanket on slopes or channels as described in the DRAWINGS for the purpose of stabilizing vegetation and erosion control.

MATERIALS

Erosion Control Blanket (Straw-Coconut) shall be Nedia SC400B or approved equivalent. The blanket shall be 100% coconut fiber matrix stitch bonded between two biodegradable, natural nettings with a total thickness of 0.33 inches and a tensile strength of 223 x 134 lb./ft.

Erosion Control Fabric (Coir) shall be Koirmat 700 or approved equivalent. The fabric shall be woven fabric of coir twine made from coconut fiber. The fabric shall have a thickness of 0.35 inches, wet tensile strength of 924 x 684 lb/ft and minimum velocity rating of 12 ft/sec.

All soil retention covering shall be secured with wooden stakes that are 24” x 2” x 4” and diagonal cut.

CONSTRUCTION REQUIREMENTS

Erosion Control Blanket (Straw-Coconut) shall be installed in floodplain overflow channels and the low benches/slopes (down to top of bankfull channel bank) within the fish passage channel. See DRAWINGS for locations.

Erosion Control Fabric (Coir) shall be installed in the upstream portions of the fish passage channel floodplain benches (down to top of bankfull channel bank) as shown and described in the DRAWINGS.

Prior to the installation of the Erosion Control Blanket (Straw-Coconut) and or Erosion Control Fabric (Coir) areas shall have soil conditioner and seeding applied as described in the DRAWINGS and Section 212 of the specifications. Perennial (Tubelings) shall be planted after the installation of the Erosion Control Blanket (Straw-Coconut) or Erosion Control Fabric (Coir).

Erosion Control Blanket (Straw-Coconut) or Erosion Control Fabric (Coir) shall be installed and secured according to the manufacturer's recommendations including appropriate soil contact, and under direction of ENGINEER or VEGETATION SPECIALIST. The soil retention covering shall be secured with wood diagonal cut stakes. The stakes shall be installed with 24” spacing along all edges and seems and 36” on center across the face of the covering.

If not installed properly, removal and all associated re-installation including soil conditioners and seeding shall be at the CONTRACTOR'S expense.

CONTRACTOR shall contact VEGETATION SPECIALIST and ENGINEER prior to Erosion Control Blanket (Straw-Coconut) or Erosion Control Fabric (Coir) order. Approval of material submittal, locations and quantities shall be given by ENGINEER and BCPOS Project Manager prior to order.

END OF SECTION

SECTION 217 HERBICIDE TREATMENT

Section 217 of the Standard Specification is hereby revised for this project as follows:

Subsection 217.03 shall include the following:

All herbicide applications will be performed and managed by a licensed commercial pesticide applicator with at least one Qualified Supervisor and Certified Operator in its employ. Provide the OWNER with current Commercial/Professional Applicator license at the pre-construction meeting. Obtain licensing from the Colorado Department of Agriculture's Division of Plant Industry. The CONTRACTOR shall always read, understand and follow the label directions. The Qualified Supervisor shall be present at all times that herbicide is applied.

Herbicide product(s) and quantity shall be selected by the CONTRACTOR's Qualified Supervisor and must be approved by OWNER and BCPOS Vegetation Specialist.

Use only an aquatic Glyphosate – based herbicide (Rodeo) within 35 feet of waterways. In addition to label directions, extra precaution should be taken by the Qualified Supervisor and Certified Operator about drift and harm to non-target aquatic organisms such as fish, aquatic insects and aquatic vegetation. Care should be taken during application to avoid drift into streams. Do not apply herbicide during precipitation or when precipitation is forecasted within 24 hours of expected application, or in winds exceeding 5 miles per hour.

END OF SECTION

SECTION 218 NOXIOUS WEED MANAGEMENT

Section 218 is hereby added to the Standard Specifications for this project and shall include the following:

218.01 This work includes the prevention, control, and monitoring of noxious weeds through an Integrated Weed Management Plan using all methods that are available for the targeted weed species in the planting areas.

CONTRACTOR will treat noxious weeds included, but not limited to those in Table 1 (Primary Invasive Plant Species Requiring Treatment) as found in the construction disturbance limits with appropriately labeled herbicides, mowing when appropriate, or physically remove the weeds within construction-disturbed areas in accordance with the Integrated Weed Management Plan. Effective noxious weed management procedures shall use a combination of the four basic methods: chemical, mechanical, cultural, or biological techniques, including prevention and monitoring. Many of the species listed can be eradicated using hand tools and mechanical means. If required due to rhizomatous growth type and/or extent of invasive plant patch, use herbicides and associated chemical compounds that include a GLYPHOSATE (**Rodeo**), or other herbicide approved by the OWNER.

Table 1. Primary Invasive Plant Species Potentially Requiring Treatment

Scientific Name	Common Name	Rhizomatous/ Requiring Herbicide
Acosta diffusa	Diffuse Knapweed	
Acosta maculosa	Spotted Knapweed	
Bromus tectorum	Cheatgrass	
Carduus nutans	Musk Thistle	
Chondrilla juncea	Rush Skeletonweed	
Cirsium arvense	Canada Thistle	Yes
Cirsium vulgare	Bull Thistle	
Euphorbia cyparissias	Cypress Spurge	Yes
Euphorbia myrsinites	Myrtle Spurge	
Fallopia japonica	Japanese Knotweed	Yes
Hesperis matronalis	Dame’s Rocket	
Kochia scoparia	Kochia	
Linaria genistifolia var. dalmatica	Dalmatian Toadflax	
Melilotus species	Sweet Clover	
Onopordum acanthium	Scotch Thistle	
Salvia aethiopis	Mediterranean Sage	
Verbascum thapsus	Common Mullein	

The CONTRACTOR shall control and prevent the spread of noxious weeds throughout awarded project sites to comply with Title CRS 35-5.5, Colorado Weed Management Act.

Prior to starting any awarded Project, CONTRACTOR will submit a proposed invasive species treatment schedule, including specific sequence and timing of control techniques, to BCPOS Vegetation Specialist for review. CONTRACTOR will not begin any Project without receiving a NOTICE TO PROCEED from the OWNER.

MATERIALS

218.02 Chemical Treatment, Mechanical Control, Cultural Control and Biological Control.

The material for Noxious Weed Management shall conform to the following:

(214) *Chemical Control*. Incorporate herbicide treatment in accordance to CDOT Standard Specification, Section 217, Herbicide Treatment. The pesticide applicator shall consult the most recent publication of the Colorado Weed Management Guide available on-line at http://www.cerc.colostate.edu/titles/XCM205.html through Colorado State University's Cooperative Extension Program. Changes by the CONTRACTOR to the provisions of the CWMG shall be pre-approved by the OWNER a minimum of 10 days prior to application.

Herbicides shall be labeled as described in Section 217, subsection 217.02 of the Standard Specifications, and labeling information shall be provided to the OWNER in accordance with subsection 217.03.

The CONTRACTOR is required to follow federal, state, and local regulations regarding herbicide materials and use.

1. Targeted weeds will be spot sprayed with backpack sprayer or hand-held nozzle. Broadcast spraying is not allowed unless approved by the OWNER.

2. Transport and handle all herbicide materials according to the label. Store all herbicide materials in a secure place in the original container.

3. Immediately respond to any leaks or spills according to the label.

4. Read and follow information on herbicide label for the "Environmental Hazards" section and, if available, any information under the "Endangered Species Protection Requirements" section.

5. Mix selected herbicide according to label.

6. Apply selected herbicides on visible invasive rhizomatous perennial plants in the planting area.

7. Dispose of any remaining herbicide mix according to the label.

(b) Mechanical Control. Mechanical control shall consist of mowing and brush cutting, hand pulling, blading, grubbing, and the use of hand operated tools, such as string trimmers or chain saws. Manually removed plants shall be pulled or severed 2 to 3 inches below plant crown.

END OF SECTION

REVISION OF SECTION 623 – IRRIGATION SYSTEM

DESCRIPTION

Section 623.01 shall be replaced with the following:

623.01 This work consists of designing, furnishing and constructing a temporary irrigation system or implementing a watering system determined by the CONTRACTOR that meets the watering requirements and performance criteria of Section 214.04 and CONTRACT.

MATERIALS

Section 623.02 shall be replaced with the following:

Section 623.02 General. All materials and equipment incorporated into the irrigation system shall be new and of recognized standard quality. All materials shall be of a standard line from a name brand manufacturer or must be approved.

CONSTRUCTION REQUIREMENTS

Section 623.03 shall be replaced with the following:

623.03 General. Irrigation/Watering systems shall be installed in conformity with applicable local codes and Colorado Division of Water Resources regulations. Information on the DRAWINGS shows general locations of planting and seeding areas only, not specific, individual plant locations. The CONTRACTOR shall design and establish exact locations of all irrigation equipment to fit field conditions. Locations will be approved by the VEGETATION SPECIALIST and/or BCPOS Vegetation Specialist prior to installing the irrigation system. CONTRACTOR shall maintain and protect the approved staking layout. Prior to purchase of any irrigation equipment, the CONTRACTOR shall submit a list of suppliers and specification sheets for all irrigation components. This submittal must be approved by BCPOS Vegetation Specialist before any equipment purchase is made. At the submittal stage, all changes in equipment shall be brought to the attention of the BCPOS Project Manager and BCPOS Vegetation Specialist.

623.04 Site Review. At least 14 days prior to the start of irrigation work on the project, a Pre-construction Conference shall be held. During irrigation installation, weekly meetings shall be held. Those in attendance shall be a representative of the CONTRACTOR's staff, the Landscape and Irrigation Subcontractors, the VEGETATION SPECIALIST and BCPOS Vegetation Specialist. A written description of work methods, and time schedules and milestone dates shall be presented. The CONTRACTOR shall notify the BCPOS Vegetation Specialist prior to mainline pressure testing, coverage tests, and final review.

END OF SECTION