

HUSTED FLOW SPLIT PROJECT

PROJECT SPECIFICATIONS

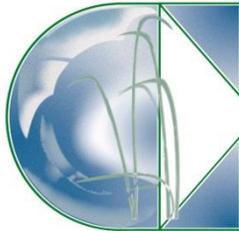
PREPARED FOR:



***Montana Fish,
Wildlife & Parks***

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Bidding and Contract Requirements are according to Montana Public Works Standard Specifications, Sixth Edition, April, 2010 (MPWSS).

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DIVISION 0:

**BIDDING AND CONTRACT
REQUIREMENTS**

DIVISION 1:

**GENERAL
REQUIREMENTS**

PART 1 - GENERAL

1.01 WORK INCLUDED:

Husted Flow Split Project, covered by this Contract, generally consists of:

- a. Excavation of the existing east channel to new dimensions.
- b. Construction of a new rock ramp at the head of the west channel to create a low flow split between east and west channels.
- c. Installation of a pin and plank structure.

1.02 CONTRACTOR USE OF PREMISES:

Confine operations to the site of the proposed Work within the access limits provided and shown on the drawings or as approved by the OWNER.

It shall be understood that the responsibility for protection and safekeeping of equipment and materials on or near the site will be entirely that of the CONTRACTOR and that no claim shall be made against the OWNER by reason of any act of an employee or trespasser whether OWNER has paid CONTRACTOR for equipment or materials in storage or not. It shall be further understood that should any occasion arise necessitating access by the OWNER to the sites occupied by these stored materials and equipment, the CONTRACTOR owning or responsible for the stored materials or equipment shall immediately remove same. No materials or equipment may be placed upon the property of the OWNER until the OWNER has agreed to the location contemplated by the CONTRACTOR to be used for storage. The CONTRACTOR shall be solely responsible for obtaining and shall pay all costs in connection with any additional work area, storage sites, access to the site, or temporary right-of-way which may be required for proper completion of the Work.

No camping is allowed within access limits without express written consent of OWNER and landowner.

No loose pets are allowed on site.

No discharging of firearms is allowed on site.

1.03 EQUIPMENT CLEANING REQUIREMENTS:

The CONTRACTOR will wash all earthwork equipment to remove seeds, roots, and rhizomes from the equipment prior to initial transport to the site in order to prevent the spread of noxious weeds to the site. (This is not meant to apply to service or employee vehicles that will stay on the roadway traveling frequently in and out of the Project area.) All earthwork equipment shall be pressure cleaned and be completely free of soil, seeds, vegetative matter, or other debris that could contain or hold seeds prior to the initial arrival to the construction site.

Equipment shall be considered free of soil, seeds, and other such debris when a visual inspection by the OWNER or ENGINEER does not disclose such material. Visual inspection shall include the complete exterior including but not limited to undercarriages, tires, wheel wells and grill works. Disassembly of equipment components or specialized inspection tools is not required.

All CONTRACTOR equipment will arrive at the work site clean and weed-free. The CONTRACTOR will periodically inspect and verify that equipment is arriving free of soil and debris capable of transporting noxious weed seeds, roots, or rhizomes.

Equipment will not be sprayed with herbicide chemicals as a preventative measure. Many herbicides target a wide range of vegetation and using herbicides in this way may harm desirable vegetation.

The CONTRACTOR will also thoroughly clean and inspect seeding equipment prior to conducting seeding activities.

1.04 FIELD CHECK OF EXISTING STRUCTURES:

The dimensions and elevations of existing structures and locations of existing fences, pipelines, conduits, cables, and equipment shown on the drawings were taken for the most part from available records and survey data and are not guaranteed for accuracy.

It shall be the responsibility of the CONTRACTOR to check all dimensions and elevations of existing structures, pipelines, conduits, cables, equipment, or other existing items, both above and below ground, affected by or affecting the Work under this contract, prior to the start of construction or ordering materials and equipment affected thereby.

The CONTRACTOR's attention is directed to the Instructions to Bidders, which requires that each BIDDER visit the site of the Work to familiarize itself with the arrangement and condition of existing construction that is to be connected to or that is to remain in place.

1.05 SITE ACCESS:

Site access shall be provided in accordance with the "Construction Access Site Plan" in the associated design documents. The CONTRACTOR shall be responsible for determining the adequacy of all roads, culverts, and bridges used in moving or gaining access for equipment and materials to the construction site. The CONTRACTOR shall provide alternative methods of access, such as a temporary crossing for any equipment that exceeds the structural limits of existing facilities.

PART 2 - PRODUCTS

2.01 TEMPORARY BUILDINGS:

A. All expenses for utilities, security and waste disposal are the responsibility of the CONTRACTOR.

B. Provide the name and telephone number of a representative who may be contacted after hours in case of emergency.

PART 3 - EXECUTION NONE

END OF SECTION 01010

PART 1 - GENERAL

1.01 WORK INCLUDED:

ENGINEER has established primary control with control points adjacent to the Work as shown in the Contract Documents. ENGINEER shall develop and make all detailed surveys needed for construction such as slope stakes, batter boards, and other working points, lines, and elevations for all other work on this project.

1.02 PRESERVATION OF REFERENCE POINTS:

Carefully preserve bench marks, reference points, lot corners, section corners, and stakes (other than those specifically designated for removal on the Drawings) and in case of destruction the CONTRACTOR shall be charged for the resetting of such points and shall be responsible for any mistakes that may be caused by their unnecessary loss or disturbance.

PART 2 - PRODUCTS NONE

PART 3 - EXECUTION NONE

END OF SECTION 01050

PART 1 - GENERAL

1.01 WORK INCLUDED:

Except as otherwise noted, the OWNER will, obtain, and pay for all requisite permits to work within the project watercourse. It is the responsibility of the CONTRACTOR to maintain, and proceed in conformity with all required permits for the Work.

The following permits will be the responsibility of the CONTRACTOR:

- a. General Permit for Storm Water Discharges Associated with Construction Activity
- b. Montana Pollution Discharge Elimination System Construction Dewatering General Permit

The following permits will be the responsibility of the OWNER:

- c. SPA 124
- d. DEQ 401
- e. USACE 404
- f. Beaverhead County Flood Plain Development Permit

CONTRACTOR represents it will perform all work in strict accordance with all Permit requirements, and will fully cooperate and timely comply with all directions of OWNER or other responsible agencies related to the Permit requirements.

CONTRACTOR represents by submitting its Bid that it has familiarized itself with all Permit requirements and will strictly comply therewith. Any fines, penalties, or other costs incurred by the OWNER arising out of or relating to the Work and/or the Permits therefore will be fully repaid to the OWNER by the CONTRACTOR.

CONTRACTOR shall obtain copies of all Permits necessary for the completion of the Work. Any costs associated Permits that must be obtained by CONTRACTOR shall be included as part of the Contract Price and no change order will be issued to increase the Contract Price because of costs associated with Permits. Prior to proceeding with the work authorized by the Permit, the CONTRACTOR shall supply to the OWNER a copy of all Permits obtained. CONTRACTOR must comply with all Permits regardless of whether or not the Permit is held in its name. CONTRACTOR shall perform all compliance testing required by the permits.

1.02 SUBMITTALS:

A. Copies of all permits obtained by CONTRACTOR.

PART 2 - PRODUCTS NONE

PART 3 - EXECUTION NONE

END OF SECTION 01060

PART 1 - GENERAL

1.01 SECTION INCLUDES:

A. Method of Measurement

B. Basis of Payment

C. Schedule-of-Values requirements for lump-sum items

1.02 SUBMITTALS:

A. A Schedule of Values for all lump-sum items within 30 days of the Notice to Proceed.

1.03 GENERAL:

The lump sum bid price for each item of the Contract shall cover all work shown on the Contract Drawings and required by the specifications and other Contract Documents. All costs in connection with the Work, including furnishing all materials, equipment, supplies and appurtenances; providing all construction plant, equipment, and tools; and performing all necessary labor and supervision to fully complete the Work, shall be included in the unit and lump-sum price bid. No item that is required by the Contract Documents for the proper and successful completion of the Work will be paid for outside of or in addition to the prices submitted in the Bid. All work not specifically set forth as a pay item in the Bid Form is considered a subsidiary obligation of the CONTRACTOR and all costs in connection therewith shall be included in the unit prices bid.

1.04 ESTIMATED QUANTITIES:

Pay items are lump-sum items or based on neat-line plan dimensions. They will be paid at neat-line or the lump-sum price bid for the items listed. The CONTRACTOR agrees to make no claim for damages, anticipated profits or otherwise on account of any difference between the amounts of work actually performed and materials actually furnished and the estimated amounts herein accept as follows.

1.05 NON-PAYMENT ITEMS:

Payment will not be made for certain items, including but not limited to:

- A. Wasted products.
- B. Products that are wasted, disposed of, or otherwise handled in an unacceptable manner.
- C. Products determined to be unacceptable in the opinion of the ENGINEER, before or after placement.
- D. Products not completely unloaded from the transporting vehicle.

- E. Products placed beyond the lines and grades of the required work.
- F. Products remaining on hand after completion of the work.
- G. Loading, hauling, and disposing of rejected products.
- H. Concrete that is delivered without a batch ticket or with a ticket that does not show actual batch weights, aggregate absorption, and aggregate-moisture content.
- I. Overly wet, overly dry, or frozen-earth material.
- J. Excavation or fill made for the convenience of the CONTRACTOR.
- K. Over excavation and backfill of over excavation.
- L. Work performed that has been rejected and/or determined to be defective.

1.07 MEASURED QUANTITIES:

A. Measurement by Volume: Measured by cubic dimension using mean length, width, and height or thickness.

1. Measurement for payment of excavations upon or against which concrete is not to be placed will be limited to the lines and grades shown on the Drawings or to the most practical lines, grades, and dimensions established by the ENGINEER, in writing. No measurement will be made of over excavations beyond design lines and grades.
2. No measurement for payment will be made for additional concrete that results from subgrade surface irregularities. Such additional concrete is considered incidental and therefore included in the Contract price for the applicable item.
3. Fill quantities will be computed using the average-end-area method or other computation method approved of by the ENGINEER.

B. Measurement by Area: Measured by square dimension using mean length and width or radius. Items that are measured by area will be measured parallel to the ground surface.

C. Linear Measurement: Measured by linear dimension at the item centerline or mean chord. Items that are measured by the lineal foot, such as pipe, will be measured parallel to the ground surface, unless otherwise specified.

D. Stipulated Sum/Price Items: Measured by weight, volume, area, or linear means, or combination, as appropriate, as completed items or units of the work.

E. Lump-Sum Items: Will not be measured for payment. However, measurements may be made to monitor work progress.

1.08 SCHEDULE OF VALUES:

A. A schedule of values or “allocation of contract price” is required for major lump sum items.

B. The schedule of values is used only to help assess the intermediate value of work completed for the purpose of making progress payments. The schedule of values is not considered as a commitment to prices in case of later negotiations.

1.09 MEASUREMENT AND PAYMENT ITEMS:

Item 1 Mobilization/Demobilization/BMPs: Includes:

1. Preparatory work and operations performed by the CONTRACTOR, including but not limited to those necessary for: the movement of personnel, equipment, supplies, and incidentals to the project site; temporary offices, utilities, buildings, and other facilities necessary for all work on the project.
2. Cleaning earthwork equipment to prevent the spread of weeds to project site.
3. Maintaining access roads, parking areas and haul roads (including grading and dust control).
4. Placement of culverts for ditch crossings.
5. Sediment control, erosion control, environmental-compliance activities.
6. Work and operations that must be performed or costs incurred before beginning work on the various items on the project site.
7. Mobilization and demobilization costs for subcontracted work/personnel.
8. Required pre-construction meeting, coordination meetings, submittals, permits, and construction schedules.
9. Providing a designated, full-time superintendent on-site.
10. Clearing and grubbing of vegetation and disposal as required for construction. Also includes stripping and stockpiling of topsoil in disturbed areas, as required by construction.
11. The cost of all work not specifically designated for payment under other Bid Items.
12. All project-specific overhead.

Progress payment for Mobilization and Preparatory work will be made, subject to acceptable construction progress, as follows:

When 5 percent of the total original Contract amount is earned from other schedule items, 50 percent of the amount bid for mobilization will be included in the progress payment. When 40 percent of the total original Contract amount is earned from other schedule items, the remaining 50 percent will be paid.

Item 2 Rock Ramp Construction: This item includes furnishing the riprap and installing a rock ramp at the head of the west channel. This item also includes salvage of existing riprap on site for use in the rock ramp, placement of fill to build out the bank, and restoration of the bank vegetation where disturbed. Work shall include hauling the material to the site, placement and all tools, equipment, labor and performance of all work necessary or incidental for the completion of this item. Measurement and payment will be made at the Contract lump-sum price.

Item 3 Channel Excavation: This item includes excavation associated with widening the existing east channel. Necessary earthwork includes the following: excavating alluvium and grading to the lines and grades shown on the Drawings or as directed by the ENGINEER. Work shall include all miscellaneous work required by the specifications or shown on the Drawings, and all materials, tools, equipment, labor and performance of all work necessary or incidental for completion of this item. Measurement and payment will be made at the Contract lump-sum price.

Item 4 Pin and Plank Structure Installation: This item includes furnishing all materials (timber, metal, gravel, fasteners, riprap, etc.) and work associated with the installation of a pin and plank structure downstream of the existing headgate. Work shall include all tools, equipment, maintenance, materials, labor, excavation, hauling, grading and performance of all work necessary or incidental to complete the project construction for this item. Measurement and payment will be made at the Contract Lump-sum price.

Item 5 Excess Material Removal: This item includes work associated with removal of excess alluvium and topsoil produced by rock ramp construction, channel excavation, and pin and plank structure installation and placement in the designated stockpile area. Work shall include loading, hauling, disposing and/or regrading of excess materials, and all tools equipment, labor and performance of all work necessary or incidental for the completion of this item. Measurement and payment will be made at the Contract Lump-sum price.

A Lump-sum price shall be based on the ENGINEER's volume estimate as shown on the Drawing. If the CONTRACTOR wishes to dispute the volume of excess material removed following completion of the project, the following procedure will be followed to determine final payment for this item:

1. The ENGINEER will perform an as-built survey of the stockpile area using the same equipment used to survey the area prior to starting the project.
2. The ENGINEER will calculate a placed material volume by comparing the topographic surface of the stockpile area prior to material placement with the topographic surface of the stockpile area following material placement.
3. If the final volume of placed material is greater than the estimated volume, the CONTRACTOR will be paid for the excess yardage at a unit price equal to the lump sum price for this bid item divided by the estimated volume as shown on the Drawings. The excess yardage will be paid for in addition to the lump sum for this bid item.
4. If the final volume of placed material is less than the estimated volume, the CONTRACTOR will be paid for the final volume of material placed at a unit price equal to the lump sum for this bid item divided by the estimated volume as shown on the Drawings.

If the CONTRACTOR does not wish to dispute the volume of excess material removed, they will be compensated for the Lump-sum price for this bid item.

Item 6 Revegetation/Restoration: Includes reclamation of all areas disturbed by construction such as areas disturbed by haul routes, staging areas, borrow areas, stockpile areas, waste areas and temporary access roads; all topsoil replacement, final grading, and preparation of the seedbed; all seeding, fertilizing and mulching; maintenance and warranty of the seed growth; and all materials, tools, equipment, labor and performance of all work necessary or incidental for completion of this item. Measurement and payment will be made at the Contract lump-sum price.

PART 2 - PRODUCTS - NONE

PART 3 - EXECUTION - NONE

END OF SECTION 01150

PART 1 - GENERAL

1.01 SECTION INCLUDES:

Procedures for work-related submittals as required in these specifications.

1.02 SUBMITTALS:

- A. Progress Schedule as required herein.
- B. Operation and Maintenance Instructions as required herein.
- C. Submittal Schedule. Submit within 15 days of Notice to Proceed (NTP).
- D. Submittal requirements are summarized at the end of this section.

1.03 DEFINITIONS:

A. Product Data: Includes standard printed information on materials products, and systems not specifically prepared for the Work, and the designation of selections from among various choices printed therein.

B. Shop Drawings: Includes specifically prepared technical data for the Work. May include drawings, diagrams, performance curves, data sheets, schedules, templates, patterns, reports, calculations, instructions, measurements and similar information not in standard printed form for general application to other contracts.

C. Samples: Include both fabricated and unfabricated physical examples of materials, products and units of Work: both as complete units and as smaller portions of units of Work; either for limited visual inspection or (where indicated) for more detailed testing and analysis.

D. Miscellaneous Submittals: Are generally non-administrative and relate directly to the Work. Examples are construction permits, Stormwater Pollution Prevention Plan (SWPPP), Spill Prevention, Control and Countermeasure Plan (SPCC), warranties, maintenance agreements, workmanship bonds, project photographs, survey data and reports, physical work records, quality testing and certifying reports, copies of industry standards, records, drawings, field measurement data, operation and maintenance materials, overrun stock, and similar information, devices, and materials applicable to the Work.

E. CONTRACTOR Review and Approval: Coordinate all submittals and review each for accuracy, completeness, and compliance with contract requirements and indicate CONTRACTOR approval thereon as evidence of such coordination and review. Items submitted to ENGINEER without evidence of CONTRACTOR approval will be returned for resubmission.

F. Sequencing and Scheduling:

1. Prepare submittal schedule to coordinate with construction sequencing and scheduling, including allowance for review time.
2. Coordinate preparation and processing of submittals with performance of the Work so that the submittal-review process does not delay Work.
3. Coordinate and sequence different categories of submittals for the same Work, and for interfacing units or Work, so that one will not be delayed for coordination with another.
4. Make all submittals far enough in advance of scheduled installation dates to provide all time required for review, for possible revisions and resubmittals, and for placing orders and securing delivery.

PART 2 - PRODUCTS - NONE

PART 3 - EXECUTION

3.01 SUBMITTAL PROCEDURE:

Submit as specified in Division 0 and as follows:

A. Date and Number: At least 10 days prior to needing approval unless otherwise specified, forward to ENGINEER all items required by the individual sections of the specifications. Unless a different number is called for in the individual sections, submit two copies of each shop drawing, two copies of all operation and maintenance instructions, and two specimens of each sample requested, of which all but one copy will be retained by ENGINEER. The other copy will be returned to CONTRACTOR along with ENGINEER comments. If CONTRACTOR wants more than one copy returned, submit the number of additional copies desired.

B. Submittal Identification: Use specification reference number, and sequence accordingly, by number. Also, use letters of the alphabet for resubmittals. For example, 03300-01, 03300-02 and 03300-03 would be the first three submittals related to Section 03300 - Cast-In-Place-Concrete. 03300-02a would be the number assigned to the first resubmittal of 03300-02, if required.

C. Cover Letter: Transmit all submittals with a cover letter identifying the project and the portion of the project (submittal identification) to which it applies. Transmit submittals that are related to or affect each other simultaneously as a package to facilitate a coordinated review. Uncoordinated submittals will be rejected. The ENGINEER reserves the right to require submittals in addition to those called for in individual sections.

3.02 ENGINEER'S APPROVAL:

The ENGINEER will indicate approval or disapproval of each submittal and, if not approved, will indicate reasons therefor. Any work done prior to approval is at CONTRACTOR's own risk. Approvals do not relieve the CONTRACTOR from responsibility for complying with the requirements of this Contract. If submittals show variations from Contract requirements, describe such variations in writing, within the aforementioned cover letter at the time of submission. Approval of such variation(s) will be accompanied with a Contract Modification involving price and time. Minor variations not involving a change in price or time of performance will not be issued a modification.

3.03 REQUIRED SUBMITTALS:

A. Suppliers and Subcontractors: Provide an updated list of all suppliers and subcontractors to be used on the project, at the pre-construction conference. Provide a final list at project closeout.

B. Certificates: For those items called for in individual sections, furnish certificates from manufacturers, suppliers, or others certifying that materials or equipment being furnished under the Contract comply with the requirements of these specifications.

END OF SECTION 01300

PART 1 - GENERAL

1.01 DEFINITIONS:

A. Quality Control - planned and specific actions or operations necessary to produce a product that complies with the contract documents. Quality control consists of actions, inspections, sampling and testing necessary to ensure the work is in compliance with the contract documents and to control production and construction processes. Quality control is keyed to the construction sequence to quickly determine when the work is out of compliance with the contract documents and to respond to correct the situation and bring the work into compliance. Quality control is the responsibility of the CONTRACTOR.

B. Quality Assurance – planned and systematic observations, testing and actions to verify that the work complies with the contract documents. Quality assurance includes oversight of the CONTRACTOR’s quality control, verifying the results of the CONTRACTOR’s testing and additional assurance sampling and testing. Quality assurance will not be adequate for the CONTRACTOR’s production and placement needs. The ENGINEER will provide quality assurance.

C. Verification/Compliance Testing – sampling and testing which is carried out independent of the CONTRACTOR’s quality control testing to confirm/verify that the work complies with the contract documents. The frequency of verification/compliance testing will be determined by the ENGINEER and may not be adequate for the CONTRACTOR’s production and placement needs. Verification/compliance testing will not be used to determine construction procedures or operations (i.e. rolling patterns, lift thickness, etc.). Verification/compliance testing will be provided by the ENGINEER.

1.02 SUBMITTALS:

A. Submit records of all CONTRACTOR tests to the ENGINEER within 24 hours of the testing. The Quality Control laboratory is to notify the CONTRACTOR and ENGINEER promptly of irregularities or deficiencies observed in the Work during performance of the Quality Control Testing.

PART 2 - PRODUCTS - NONE

PART 3 - EXECUTION

3.01 GENERAL:

A. Quality control testing frequency is at CONTRACTOR discretion, except where tests are specifically required for individual materials/products. CONTRACTOR is responsible to determine the type and quantity of testing necessary for adequate quality control to provide completed WORK in compliance with these specifications.

3.02 COOPERATION WITH QUALITY ASSURANCE:

A. Assure that the OWNER's personnel and ENGINEER have access to all work areas at all times work is in progress. Provide any special facilities or equipment to access work areas at CONTRACTOR'S expense.

B. Notify the ENGINEER when the work is ready for quality assurance testing. Establish and update the construction schedule to provide the ENGINEER estimated sampling/testing dates and times. OWNER may choose to obtain a split and comparison test of any samples collected for quality control testing. Provide adequate notice of testing plans to coordinate collection of samples.

END OF SECTION 01400

DIVISION 2:

SITWORK

PART 1 - GENERAL

1.01 DESCRIPTION:

This work consists of furnishing and placing a geotextile fabric as a permeable separator between dissimilar materials, such as between subgrade and subbase/base, subgrade and gabions, permanent erosion control measure, sediment control device or subsurface drainage fabric, and to aid in stabilizing poor subgrade soils.

1.02 SUBMITTALS:

A. Manufacturer's specifications that include at a minimum the properties contained in Table 02070-1.

B. Geotextile samples.

PART 2 - PRODUCTS

2.01 FILTER FABRIC

A. Filter fabric geotextile shall be Geotex 801 or approved equal that meets the average roll values in Table 02070-1.

2.02 PHYSICAL AND CHEMICAL REQUIREMENTS:

Fibers used in the manufacture of geotextiles, and the threads used in joining geotextiles by sewing, shall consist of long-chain synthetic polymers, composed of at least 85% by weight polyolefins, polyesters, or polyamids. They must be formed into a network so the filaments on yarns retain dimensional stability relative to each other, including selvages. All non-woven geotextile shall be needle punched. Heat-bonded or resin-bonded geotextiles shall not be used. Geotextile materials shall meet the physical requirements of Table 02070-1.

TABLE 02070-1 Non-woven Geotextile Filter Fabric Minimum Average Roll Values			
Property	Test Method	Value	Units
Tensile Strength	ASTM D 4632 Grab test	205	lbs
Puncture Strength	ASTM D 4833	525	lbs
Elongation at Failure	ASTM D 4632	≥50	%
Trapezoidal Tear	ASTM D 4533	80	lbs
Ultraviolet light (% residual tensile strength)	ASTM D 4355 150-hr exposure	70	%
Permittivity	ASTM D 4491	1.5	sec ⁻²
Water Flow Rate	ASTM D 4491	110	gal/min/ft ²
Apparent Opening Size	ASTM D 4751	#80 max.	U.S. Sieve Size

2.03 CERTIFICATION:

Submit product certification stating the name of the manufacturer, the chemical composition of the filaments or yarns, and other information fully describing the geotextile. Mismatching or misrepresentation by the manufacturer is reason to reject the geotextile under these specifications.

Label the fabric and its container with the manufacturer's name fabric type or trade name, lot number, and quantity.

2.04 SHIPMENT AND STORAGE:

During shipment and storage, protect the fabric from direct sunlight, ultra-violet rays, temperatures exceeding 140 F (60 C), mud, dust, and debris. Keep the fabric in the manufacturer's wrapping until just before use. Include in each shipping document a certification that the geotextile meets the manufacturer's certificate and guarantee previously submitted.

PART 3 - EXECUTION

3.01 GENERAL:

Replace or repair all geotextile that is torn, punctured, or muddy. Remove the damaged material and place a patch of the same type of geotextile overlapping 3 feet (0.9m) beyond the damaged area.

3.02 FILTER FABRIC APPLICATIONS:

Store, handle, and deploy filter fabric in accordance with manufacturer recommendations and as specified herein. Place filter fabric between the prepared subgrade and gabion revetments or riprap, geocell cellular confinement, and other locations as shown on the Drawings. Subgrades will be subject to approval by the ENGINEER prior to placement of filter fabric. Place filter fabric by unrolling the fabric from the top of the slopes to the toe areas. Overlap successive geotextile sheets in such a manner that the upstream sheet is placed over the downstream sheet

and/or up slope over down slope. Overlap adjacent seams a minimum of 2 feet when over compacted subgrade (e.g., upstream face of dam and compacted subgrade soils on stilling basin sides). Make seam overlaps 3 feet in areas of poor subgrade compaction (e.g., under stilling basin bottoms). Provide a minimum offset of 5 feet between adjacent roll ends. Anchor fabric or otherwise hold firmly in place to prevent movement during construction. Pins or other methods that puncture the fabric are not allowed. Place filter fabric and secure against the prepared subgrade surfaces such that the geotextile is in continuous (smooth) contact between the geotextile and subgrade with no void areas or wrinkles.

END OF SECTION 02070

PART 1 - GENERAL

1.01 SECTION INCLUDES:

A. Reclamation and seeding requirements: all areas disturbed as part of the construction shall be reclaimed and seeded.

1.02 SUBMITTALS:

A. Seed: Submit seed certifications for approval at least 7 days prior to any seeding. Provide seed mixture in containers showing percentage of pure live seed, seed mix, year of production, net weight, date of packaging, and location of packaging. Provide weed free certification statement from seed supplier. Provide seed certifications with each delivery.

PART 2 - PRODUCTS

2.01 TOPSOIL:

A. Topsoil: Excavated from site and free of excess vegetation.

- 1 Obtain topsoil from that stockpiled during stripping operations, free of excess vegetation, metal, glass, plastic, and not containing gravel or pieces of wood larger than 3 inches.

2.02 SEED:

A. Wetland Seed Mix Shall Be:

WETLAND SEED MIX

COMMON NAME:	ESTIMATED RATE (LBS. PURE LIVE SEED / ACRE)
AMERICAN SLOUGHGRASS	0.9
CREEPING SPIKERUSH	1.3
WESTERN MANNAGRASS	0.7
SM FRUIT BULLRUSH	0.3
TUFTED HAIRGRASS	0.4
TOTAL SEED:	3.6

B. Floodplain Seed Mix Shall Be:

FLOODPLAIN SEED MIX

COMMON NAME:	ESTIMATED RATE (LBS. PURE LIVE SEED / ACRE)
SLENDER WHEATGRASS	6.0
CANBY BLUEGRASS	1.0
STREAMBANK WHEATGRASS	7.0
THICKSPIKE WHEATGRASS	6.0
WESTERN WHEATGRASS	6.0
TOTAL SEED:	26.0

C. All seed shall comply with and be labeled in accordance with the Montana Seed Law. Seed shall have been grown in the North American Continent, in an area having climatic conditions and elevation similar to area of use. All seed should be of standard grade. The seed may be rejected by the ENGINEER if the point of origin and production is not suitable.

D. Unacceptable Weeds: Dandelion, Jimsonweed, Quackgrass, Knapweed, Horsetail, Morning Glory, Rush Grass, Mustard, Leafy Spurge, Lambsquarter, Chickweed, Cress, Crabgrass, Canadian Thistle, Nutgrass, Poison Oak, Blackberry, Tansy Ragwort, Bermuda Grass, Johnson Grass, Poison Ivy, Nut Sedge, Nimble Will, Bindweed, Bent Grass, Wild Garlic, and Perennial Sorrel.

PART 3 - EXECUTION

3.01 SUBSTRATE PREPARATION

A. Eliminate uneven areas and low spots.

B. Remove debris, roots, branches, stones, in excess of 3 inches in size. Remove subsoil contaminated with petroleum products.

C. Scarify subgrade to depth of 3 inches where topsoil is scheduled. Scarify in areas where equipment is used for hauling and spreading topsoil and has compacted subsoil.

3.02 PLACING TOPSOIL:

A. Place topsoil in areas disturbed by the Work to a nominal compacted depth of 4 inches. Place topsoil during dry weather.

B. Fine grade topsoil eliminating rough or low areas. Maintain profiles and contour of subgrade and blend into native adjacent areas.

C. Remove roots, weeds, rocks and foreign material while spreading.

D. Manually spread topsoil close to trees and plants to prevent damage.

E. Lightly compact placed topsoil.

F. Waste surplus subsoil and topsoil on site.

G. Leave stockpile area and site clean and raked, ready to receive landscaping.

H. Tolerances: Top of Topsoil: Plus or minus 1/2 inch.

I. Protection: Protect landscaping and other features remaining as final work, protect fences and existing utilities.

3.03 SEEDING:

A. Wetland seed shall be sown at the rate of 3.6 pounds pure live seed per acre on wetland areas using broadcast methods specified in the seed table in section 2.02. The drill seed rate is half the broadcast application rate. Seeding by hand or mechanical broadcasting will be permitted on areas inaccessible to drills or impractical to seed by other prescribed methods as approved by the Engineer. Seed shall be lightly tilled by rake or other means into first inch of topsoil depth. Solid rock embankments may be left exposed where erosion will not become an issue. The ENGINEER shall be the final authority in deciding where seeding shall occur.

B. Floodplain seed shall be sown at a rate of 26 pounds pure live seed per acre on the floodplain using broadcast methods specified in the seed table in section 2.02. The drill seed rate is half the broadcast application rate. Seeding by hand or mechanical broadcasting will be permitted on areas inaccessible to drills or impractical to seed by other prescribed methods as approved by the Engineer. Seed shall be lightly tilled by rake or other means into first inch of topsoil depth. Solid rock embankments may be left exposed where erosion will not become an issue. The ENGINEER shall be the final authority in deciding where seeding shall occur.

C. Planting Season: Between September 15 and May 15.

D. Do not sow immediately following rain, when ground is too dry, or during windy periods. Wind speed should not exceed 5 mph.

E. All disturbed areas shall be seeded unless otherwise directed.

3.04 EROSION CONTROL:

Erosion Control measures shall be provided in the SWPPP.

3.06 CLEANUP OF AREA:

A. Upon completion of the work, clear the entire project site of all debris. Present ground surface with smooth, uniform slopes and with a neat, workmanlike appearance. Repair or replace any utilities, structures, landscaping, grass areas, etc. that are damaged due to negligence of the CONTRACTOR, at no expense to the OWNER.

END OF SECTION 02910

PART 1 - GENERAL

1.01 DESCRIPTION:

Work shall consist of furnishing all equipment, materials, labor and performing all operations in connection with construction of the stream restoration as shown on the drawings.

1.02 REFERENCES:

USDA – NRCS CONSTRUCTION SPECIFICATION MT-582-1

PART 2 - PRODUCTS

2.01 MATERIALS:

Construction materials shall conform to the requirements shown on the drawings, or as specified.

- A. **Sod Mats:** Viable sod with a minimum thickness of 8 inches for sedge species and 6 inches for grass species shall be placed where indicated on the drawings. Sod shall originate from a similar hydrologic and climatic regime as the zone being sodded to ensure plant species suitability and viability. Sod borrow areas are depicted on the drawings. Additional borrow areas may be determined by the ENGINEER.
- B. **Shrub Transplants:** Woody Shrubs shall consist of native willow species located adjacent to the channel. Shrubs shall range in height from 4 to 12 feet.
- C. **Channel Gravels:** Native gravels consisting of sorted gravels, sand, and cobbles shall be used for channel regrading, fill, and narrowing.

PART 3 – EXECUTION

3.01 EXCAVATION:

- A. All excavation shall be classified as common excavation or rock excavation. Common excavation shall be defined as excavation of all materials that can be excavated, loaded, transported, and unloaded by use of heavy ripping equipment and wheel-tractor scrapers with pusher tractors. Also excavated material that can be dumped into place or loaded onto hauling equipment by means of excavators, having a rated capacity of one cubic yard, shall be classified as common excavation. The equipment shall be equipped with attachments (such as shovel, bucket, backhoe, and backhoe with thumb) appropriate to the character of the materials and the site conditions.

- B. Excavated materials shall be used in the construction of required permanent earthen fill as shown on the drawings or as specified. The contractor shall not waste or otherwise dispose of suitable excavated materials. All surplus or unsuitable excavated materials shall be disposed of by the Contractor as directed by the ENGINEER and in accordance to applicable laws and regulations, or as shown on the drawings.

3.02 STRIPPING AND TRANSPLANTING STRIPPED MATERIALS:

- A. Stripping consists of excavating the top layer of soil that contains sod, vegetation, roots, and organic matter. Stripping is required at all sites upon which embankments and fills used to impound or prevent the seepage of water are to be constructed and at required excavations and borrow areas. Stripping shall be to sufficient depth to expose subsoil reasonably free of roots and organic matter.
- B. Materials suitable for use in sodding, sod mats, and transplanting, or other plantings shall be used for such purposes in the construction of the project to the fullest extent practical prior to the import of materials from off site. The materials shall be stripped, transported, and placed immediately in one operation to the fullest extent practical. Any materials requiring salvage and stockpiling for sodding, transplanting, or other plantings at a later date shall be kept viable by cooling, moistening, or other measures as needed.

3.03 TRANSPLANTING SOD MATS

- A. Sod shall be set firmly in place to ensure complete contact with the base material. Sod shall be placed to cover the entire required surface with minimal voids or loose and protruding edges that would likely be dislodged by flowing water. Immediately after placement the sod shall be thoroughly wetted.

3.04 TRANSPLANTING SHRUBS

- A. Transplants shall originate from a hydrologic and climatic regime similar to that of the planting site to ensure plant suitability and viability. Transplants for clump plantings shall be harvested in such a manner that most of the root structure and associated soil is retained as a unit (clump). The clump shall be transported and planted directly into a site prepared for the clump planting. Repetitive handling, loading, unloading, and transport of the clump that damages the integrity of the root-soil mass or reduces the viability of the plants shall not be permitted.
- B. Clump plantings shall be pruned to remove 10 to 50 percent of the vegetation of each stem in lieu of thinning. The pruning operation shall ensure that the majority of the flowering parts of the clump plantings are removed.
- C. Transplants shall be thoroughly wetted immediately after placement.
- D. Root balls must be placed at a depth that reaches the low water table elevation as directed by ENGINEER.

- E. Backfill will be placed around willow transplants to ensure proper root contact with soils and reduce desiccation. Suitable backfill materials include alluvium, topsoil and vegetated sod mats. Backfill guidance will be provided by ENGINEER.

3.05 IN-STREAM CHANNEL EXCAVATION/EARTHFILL

- A. In-stream channel excavation/fill including channel grading and pool/riffle construction shall be conducted as shown on the drawings and as directed by the ENGINEER.

3.06 COMPACTION:

- A. For clean sands, gravel, and cobble fill materials, no compaction other than that obtained by placement is required, unless compaction is needed to ensure void areas are completely filled. Such may be needed to ensure voids are filled beneath and alongside log and rock structures.
- B. Sand, silt, and clay fill materials shall be smoothed and shaped in lifts no thicker than 8 inches prior to compaction. Compaction shall be obtained by a minimum of 2 passes over the entire surface with weighted-wheeled excavation equipment, manually-directed power tampers, or 2 blows with the back of an excavator bucket with a force that produces compaction comparable to that developed by wheeled excavation equipment. The top 4 inches of surfaces to be seeded or sodded shall not require compaction in addition to that obtained in the smoothing and shaping operation.

END OF SECTION 02950

PART 1 - GENERAL

1.01 DESCRIPTION:

Work shall consist of furnishing and constructing a rock ramp at the location indicated in the Plans and as directed by the Engineer.

PART 2 - PRODUCTS

2.01 MATERIALS:

Construction materials shall be furnished in accordance with the Plans and shall be approved by the Engineer prior to use.

- A. **Rock:** The rock ramp shall be constructed of angular rock. The size and quality of rock shall be subject to approval by the Engineer. The use of rock in stream projects requires a dense, low porosity material that can withstand stream flows as well as freeze-thaw cycles. When possible, consideration should be given to obtaining rock that is similar in color and texture to the native stone in the project area. Rock should be of sufficient hardness to resist weathering and shall be free of cracks and other blemishes. Porous rock, such as some limestones, and soft rock, such as shales, are not allowed. In some cases, the Engineer may authorize native rock present on the site for use. In no instance will concrete or other debris rock be allowed.

The rock shall meet the requirements of Table 02970-2 (Riprap for Rock Ramp).

- B. **Geotextile:** Geotextile shall be used where the rock ramp ties into the existing streambanks. Geotextile shall meet the requirements in specification section 02070. Streambank material may be suitable as filter material. Geotextile may be eliminated with approval from ENGINEER.

PART 3 – EXECUTION

3.01 EXCAVATION OF CHANNEL BED:

- A. All excavation shall be classified as common excavation or rock excavation. Common excavation shall be defined as excavation of all materials that can be excavated, loaded, transported, and unloaded by use of heavy ripping equipment and wheel-tractor scrapers with pusher tractors. Also excavated material that can be dumped into place or loaded onto hauling equipment by means of excavators, having a rated capacity of one cubic yard, shall be classified as common excavation. The equipment shall be equipped with attachments (such as shovel, bucket, backhoe, and backhoe with thumb) appropriate to the character of the materials and the site conditions
- B. Excavated materials shall initially be used in the construction of a coffer dam and then hauled to a location designated on the Plans or as directed by the ENGINEER.

3.02 PLACEMENT OF RIPRAP FOR ROCK RAMP:

- A. The construction of a rock ramp requires equipment that can place rock in precise locations. An excavator of a suitable size, and equipped with a thumb, is strongly recommended.
- B. The rock ramp shall be constructed so that the crest elevation is in accordance with the Plans.
- C. The upstream end of the rock ramp shall be keyed into the streambank as indicated on the Plans.
- D. Rocks shall be installed as shown in the Plans and shall be firmly keyed into the streambed. To ensure proper placement, the Contractor shall construct a coffer dam and place the rock in an excavated trench with non-flowing water conditions.
- E. The crest of the rock ramp shall be placed with tight, continuous surface contact between adjoining rocks.
- F. Upon completion of the work, the Contractor shall reshape the slopes and stream bottom to the specified elevations on the plans or as directed by the ENGINEER. All unsuitable and surplus rocks shall be removed from the site.

END OF SECTION 02960

PART 1 - GENERAL

1.01 DESCRIPTION:

This work consists of furnishing and placing various rock materials as a cover of stone or fragmented rock along embankment slopes or stream banks, and at other specified locations.

PART 2 - PRODUCTS

2.01 RIPRAP

- A. Furnish stone that is hard, durable, and angular in shape, resistant to weathering and water action, free from overburden, spoil, shale, structural defects, and organic material. Each stone must have its greatest dimension not greater than three times its least dimension. Do not use rounded stone or boulders from a streambed source as riprap. Do not use shale or stone with shale seams.
- B. Place the riprap at the locations specified in the Plans. Uniformly distribute the smaller stones throughout the work. Manipulate the stones by hand or machine to provide a uniform surface and stable mass. Provide the riprap thickness specified in the Plans.
- C. Class II riprap shall meet the physical requirements of Table 02970-1.

TABLE 02970-1 Class II Riprap		
% of Total Weight That Must be Smaller Than Given Size	Equivalent Spherical Diameter (ft)	Weight of Stone (lb)
100	2.00	700
70-90	1.79	500
40-60	1.32	200
0-10	0.61	20

Note: Weight of Stone based on unit weight of 165 pounds per cubic foot.

D. Riprap for the rock ramp shall meet the physical requirements of Table 02970-2.

TABLE 02970-2 Riprap for Rock Ramp		
% of Total Weight That Must be Smaller Than Given Size	Equivalent Spherical Diameter (ft)	Weight of Stone (lb)
100	3.25	2950
70-90	2.60	1510
40-60	2.15	875
0-10	1.30	190

Note: Weight of Stone based on unit weight of 165 pounds per cubic foot.

E. Riprap may be stockpiled on site in the area agreed on by the CONTRACTOR and ENGINEER.

PART 3 - EXECUTION

3.01 GENERAL:

The subgrade surfaces on which the rock materials are to be placed shall be cut or filled and graded to the lines and grades shown on the drawings. Rock materials shall not be placed until the foundation preparation is completed and the subgrade surfaces have been inspected and approved by the Engineer.

3.02 ROCK MATERIAL APPLICATIONS:

The rock materials shall be placed by equipment on the surfaces and to the depths specified. The rock shall be constructed to the full course thickness in one operation and in such a manner as to avoid serious displacement of the underlying materials. The rock shall be delivered and placed in a manner that will insure that the rock in place shall be reasonably homogeneous with the larger rocks uniformly distributed and firmly in contact one to another with the smaller rocks filling the voids between the larger rocks. Rock materials shall not be dropped from a height greater than three feet on geotextile. Sufficient hand work shall be done to produce a dense section with a neat and uniform surface.

END OF SECTION 02970