RICE RESERVOIR DAM
SPILLWAY RECONSTRUCTION PROJECT
CLAREMONT, NEW HAMPSHIRE

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BID FORM

TO: City of Claremont, NH  Date: __________________________
58 Opera House Square
Claremont, NH 03743

SUBJECT: Rice Reservoir Dam Spillway Reconstruction Project
Claremont, New Hampshire

Proposal submitted by: ____________________________________________

The undersigned proposes to furnish all labor, materials, tools and equipment in complete
accordance with the provisions of the Contract Documents dated March 27, 2017.

The Bidder acknowledges receipt of and includes the requirements of the following Addenda:

Number        Date

__________________________________________  __________________________
__________________________________________  __________________________
__________________________________________  __________________________

In submitting this Bid, the undersigned agrees:

1. The Bid shall remain in full force and will not be withdrawn for a period of sixty (60)
calendar days after the actual date of Bid opening thereof.

2. To enter into and execute a contract, if awarded on the basis of this Bid.

3. To accomplish the work in accordance with the Contract Documents.

4. To complete the work within the period stipulated.

5. To minimize disruption to the existing facility which will remain occupied and
operational during the implementation of the work.

6. The Bid price submitted on this project shall include all material, labor, taxes, fees,
permits, disposal and all freight charges, for a total cost to Owner.

BID SECURITY

Required Bid security in the form of a Bid Bond or Certified Check in the amount of 5% of the
Bid shall be attached to this Bid.
## BID FORM

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**TOTAL** $______________

The undersigned agrees to complete the work for the Total Base Lump Sum Price of:

**Bid (Lump Sum):**

$ ____________________________

In words: ____________________________

In the event the amount of Earth Excavation and Rock Excavation varies by more than 5% from the amount stipulated as part of the Base Bid, the Bidder shall include a unit price that will be used to calculate a "deduction" from or an "addition" to the Base Bid as may be the case.

Unit Price Earth Excavation $______________ / cubic yard

Rock Excavation $______________ / cubic yard
Notes:

1. The City of Claremont reserves the right to waive any informalities and reject any and all Bids.

2. The City of Claremont may also select to delete some of the Base Bid items as they may choose.

3. The Bidder **will not** unbalance the Bid prices as the Owner reserves the right to delete items in the Bid at any time.

4. The City of Claremont **WILL NOT** be responsible for calculating the Bid from the “Bid Form” or be responsible for any mathematical errors that the Bidders may make. The City of Claremont **WILL** utilize the “**TOTAL Base Bid (Lump Sum)**” as the determining factors for selection of the successful Bidder.

5. Include Qualifications to the Bid (if any) under separate cover.
Standard Form of Agreement
Between the City of Claremont and

This agreement is made: _______________________, 2017

BY AND BETWEEN the Owner: City of Claremont NH
58 Opera House Square
Claremont, NH 03743

And the Contractor: TBD

For the following Project: Rice Reservoir Dam Spillway Reconstruction Project
In accordance with the conditions as set forth in the April 14, 2017 – City of Claremont’s Invitation to Bid and the Contractors proposal submitted to the City of Claremont and publicly opened on May 9, 2017.

Anticipated commencement date of Project: June 1, 2017

Completion date of Project: Substantial Completion: September 15, 2017
Final Completion: October 1, 2017

Contract Sum: $___________________

The Contract Sum shall include all items and services necessary for the proper execution and completion of the Work, as defined herein.

Contractor shall perform the work described in the Contract Documents for this project. The documents consist of:

1. This Agreement signed by the Owner and Contractor;
2. General Terms and Conditions included in this Agreement;
3. Drawings and Specifications provided with the bid documents;
4. Addenda, exhibits and schedules attached hereto;
5. Written change orders or orders for minor changes in the Work issued after execution of this Agreement.
Description of Services

Contractor shall provide materials and services as may be required for the spillway reconstruction of the spillway at the Rice Reservoir Dam in Claremont as set forth in Schedule A, attached hereto and incorporated herein (referred to as “the Work”).

General Terms and Conditions

1. The Work includes construction and services required by the Contract Documents, including all labor, materials, equipment and services provided by the Contractor to fulfill the Contractor’s obligations.

2. All Work is to be performed in accordance with the Contract Documents. If concealed or unknown physical conditions are encountered at the site that differ materially from those indicated in the Contract Documents or from those conditions ordinarily found to exist, or if Contractor is unable to perform due to the unavailability of materials as specified, said unavailability being beyond Contractor’s control, the Contract Sum and Contract Time shall be subject to equitable adjustment following authorization by Owner of the changes and shall be set forth in writing.

3. A Change Order is defined as a written order to Contractor signed by Owner to change the Work, Contract Sum or Contract Time. See Section entitled Changes in the Work.

4. If Contractor defaults or fails to carry out the Work in accordance with the Contract Documents and fails to correct such default or neglect with diligence and promptness within seven (7) days after receipt of written notice from Owner, Owner may, without prejudice to other remedies, correct such deficiencies. In such case, a Change Order shall be issued deducting the cost of correction from payments due Contractor.

5. Owner reserves the right to perform construction or operations related to the project with the Owner’s own labor and resources, and to award separate contracts in connection with other portions of the Project not expressly included in the scope of the Work.

6. Costs caused by delays or by improperly timed activities or defective construction shall be borne by the responsible party.

7. The Owner is the City of Claremont, New Hampshire identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Owner shall designate in writing a representative who shall have express authority to bind the Owner with respect to all matters requiring the Owner’s approval or authorization. The term “Owner” means the Owner or the Owner’s authorized representative.

8. The Contractor is defined as the entity that shall perform the Work in accordance with the Contract Documents. The Contractor is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The term “Contractor” means the Contractor or the Contractor’s authorized representative.
The Contractor shall not be relieved of obligations to perform the Work in accordance with the Contract Documents either by activities or duties of the Engineer in the Engineer’s administration of the Contract, or by tests, inspections or approvals required or performed by persons other than the Contractor.

9. The Engineer is The H.L. Turner Group Inc. and will provide administration of the Contract as described in the Contract Documents, and will be the Owner’s representative during construction.

The Engineer, as a representative of the Owner, will visit the site at intervals appropriate to the stage of the Contractor’s operations (1) to become generally familiar with and to keep the Owner informed about the progress and quality of the portion of the Work completed, (2) to endeavor to guard the Owner against defects and deficiencies in the Work, and (3) to determine in general if the Work is being performed in a manner indicating that the Work, when fully completed, will be in accordance with the Contract Documents. However, the Engineer will not be required to make exhaustive or continuous on-site inspections to check the quality or quantity of the Work. The Engineer will neither have control over or change of, nor be responsible for, the construction means, methods, techniques, sequences or procedures, or for the safety precautions and programs in connection with the work, since these are solely the Contractor’s rights and responsibilities under the Contract Documents.

The Engineer will not be responsible for the Contractor’s failure to perform the Work in accordance with the requirements of the Contract Documents. The Engineer will not have control over or charge of, and will not be responsible for acts or omissions of the Contractor, Subcontractors, or their agents or employees, or any other persons or entities performing portions of the Work.

The Engineer will have authority to reject Work that does not conform to the Contract Documents. Whenever the Engineer considers it necessary or advisable, the Engineer will have authority to require inspection or testing of the Work.

The Engineer will review and approve or take other appropriate action upon the Contractor’s submittals such as Shop Drawings, Product Data and Samples, but only for the limited purpose of checking for conformance with information given and the design expressed in the Contract Documents.
Responsibilities of Contractor

1. Contractor shall supervise and direct the Work, which shall be performed and completed by the Contractor using Contractor’s best skill and attention. Contractor shall be solely responsible for and have control over construction means, methods, techniques, sequences and procedures, and for coordinating all portions of the Work.

2. Unless otherwise provided in the Contract Documents, Contractor shall provide and pay for labor, materials, equipment, tools, utilities, transportation, and other facilities and services necessary for proper execution and completion of the work.

3. Contractor shall deliver, handle, store and install materials in accordance with the manufacturers’ instructions. Contractor shall arrange for all manufacturers warranties on materials and equipment used in the Work to be transferred to Owner.

4. Contractor warrants to the Owner that (1) materials and equipment furnished under the contract will be new and of good quality unless otherwise required or permitted by the Contract Documents; (2) the Work will be free from defects; and (3) the Work will conform to the requirements of the Contract Documents.

5. Contractor warrants that the services performed under this Agreement will be performed and completed by Contractor in a workmanlike manner according to the standards of Contractor’s profession and with the skill, diligence and quality expected of a recognized professional performing services of this nature. Contractor shall perform the services hereunder with and by Contractor’s own means and employees, free from detailed supervision, inspection or control by the Owner, except for such inspection as may be necessary to enable the Owner or Engineer to confirm that the services performed comply with the requirements of this Agreement, including satisfactory rates of progress.

6. Contractor shall obtain and pay for all permits, fees, licenses and inspections necessary for proper execution and completion of the Work.

7. Contractor agrees to maintain at Contractor’s sole expense all licenses that may be required by law or regulation for the performance of its services and that failure to maintain such licenses is cause for immediate termination of this Agreement. Contractor agrees to register with the New Hampshire Secretary of State, if required, as a non-resident legal entity in order to transact business in New Hampshire.

8. Contractor shall promptly review, approve in writing and submit Shop Drawing, Product Data, Samples and similar submittals required by Owner. Contractor shall be responsible for all engineering required for completion of the Project in compliance with this Agreement.

9. Contractor shall keep the premises and surrounding area free from accumulation of debris and trash related to the Work. Contractor shall be responsible for removal and disposal of all construction debris and waste from the work site in accordance with all local, state and federal laws, rules and regulations.
10. Contractor shall be responsible for initiating, maintaining and supervising all safety precautions and programs, including all those required by law in connection with performance of the Work. Contractor shall promptly remedy damage and loss to property caused in whole or in part by Contractor, Subcontractor or anyone for whose acts Contractor may be liable.

11. Contractor shall promptly correct Work rejected by Owner as failing to conform to the requirements of the Contract Documents. Contractor shall bear the cost of correcting such rejected work.

12. Contractor agrees it shall comply with all Federal, State and Local laws and regulations applicable to the Work.

**Time**

Time limits as stated in the Contract Documents are of the essence. If Contractor is delayed at any time during performance of the Work by changes in the Work or by labor disputes, fire, unusual delay in deliveries, unavoidable casualties or other causes beyond Contractor’s control, the Contract Time shall be extended by Change Order for such reasonable time as may be determined.

**Payment and Completion**

The Contract Sum shall include all items and services necessary for the proper execution and completion of the Work.

Based on Contractor’s Application for Payment, Owner shall pay to Contractor as follows: net thirty (30) days after invoice.

Invoices shall be submitted monthly for completed in-place quantities. Owner will hold a ten percent (10%) retainage on all invoices until fifty percent (50%) completion, five percent (5%) retainage on all invoices up to and including the date of substantial completion, and will hold two percent (2%) retainage until one (1) year after final completion of the Project (determined by the completion of all punch-list items).

The Contract Sum stated in the Agreement, including authorized adjustments, is the total amount payable in accordance with the values stated in the Agreement. Such application shall be supported by such data substantiating the Contractor’s right to payment as Owner may reasonably require and reflecting retainage, as provided herein.

Contractor shall guarantee all materials and workmanship to be free from any defects for a period of one year from final acceptance by the Owner. Contractor warrants that title to all Work covered by an Application for Payment will pass to Owner no later than the time of payment. Contractor further warrants that upon submittal of an Application for Payment, all Work for which the Application for Payment is made shall, to the best of the Contractor’s knowledge, information and belief, be free and clear of liens, claims, security interests or other encumbrances adverse to Owner’s interests.
No later than upon receipt of payment from Owner, Contractor shall promptly pay each Subcontractor and material supplier on account of such entities’ portion of the Work. Owner shall have no responsibility for payment of money to any Subcontractor or material supplier.

Any payment or progress payment, or partial or entire use or occupancy of the project by Owner shall not constitute acceptance of the Work not in accordance with the requirements of the Contract Documents.

Substantial completion is that stage in the progress of the Work when the Work or designated portion thereof is sufficiently complete in accordance with the Contract Documents so that Owner can occupy or utilize the Work for its intended use. When the Work or designated portion thereof is substantially complete, Owner shall issue a Certificate of Substantial Completion and Contractor and Owner shall establish responsibilities for completion and shall fix the time within which Contractor shall furnish all items listed for final completion (the “punch list”).

Warranties required by the Contract Documents shall commence on the date of Substantial Completion of the Work or designated portion thereof unless otherwise provided in the Certificate of Substantial Completion.

In addition to Contractor’s other obligations, including warranties, under the Agreement, the Contractor shall, for a period of one (1) year after Substantial Completion, correct Work not conforming to the requirements of the Contract Documents. If Contractor fails to correct nonconforming Work within a reasonable time, Owner may correct it and Contractor shall reimburse Owner for the cost of the correction.

Tests, inspections and approvals of portions of the Work required by the Contract Documents or by-laws, ordinances, rules, regulations or orders of public authorities having jurisdiction shall be made at an appropriate time, as may be required. If additional testing is required, Contractor shall perform these tests and forward results to Owner as soon as practical.

Changes in the Work

General: Changes in the Work may be accomplished after execution of the Contract, and without invalidating the Contract, by Change Order, Construction Change Directive or order for a minor change in the Work.

A Change Order shall be based upon agreement among the Owner, Contractor and Engineer; a Construction Change Directive requires agreement by the Owner and Engineer and may or may not be agreed to by the Contractor; an order for a minor change in the Work may be issued by the Engineer alone.

Changes in the Work shall be performed under applicable provisions of the Contract Documents, and the Contractor shall proceed promptly, unless otherwise provided in the Change Order, Construction Change Directive or order for a minor change in the Work.
1. **Change Orders**

A Change Order is a written instrument prepared by the Engineer and signed by the Owner, Contractor and Engineer, stating their agreement upon all of the following:

a. Change in the Work;

b. The amount of the adjustment, if any, in the Contract Sum; and

c. The extent of the adjustment, if any, in the Contract Time.

2. **Construction Change Directives**

A Construction Change Directive is a written order prepared by the Engineer and signed by the Owner and Engineer, directing a change in the Work prior to agreement on adjustment, if any, in the Contract Sum or Contract Time, or both. The Owner may by Construction Change Directive, without invalidating the Contract, order changes in the Work within the general scope of the Contract consisting of additions, deletions or other revisions, the Contract Sum and Contract Time being adjusted accordingly.

A Construction Change Directive shall be used in the absence of total agreement on the terms of a Change Order.

If the Construction Change Directive provides for an adjustment to the Contract Sum, the adjustment shall be based on one of the following methods:

a. Mutual acceptance of a lump sum properly itemized and supported by sufficient substantiating data to permit evaluation;

b. Unit prices stated in the Contract Documents or subsequently agreed upon;

c. Cost to be determined in a manner agreed upon by the parties and a mutually acceptable fixed or percentage fee; or

Upon receipt of a Construction Change Directive, the Contractor shall promptly proceed with the change in the Work involved and advise the Engineer of the Contractor’s agreement or disagreement with the method, if any, provided in the Construction Change Directive for determining the proposed adjustment in the Contract Sum or Contract Time.

A Construction Change Directive signed by the Contractor indicates the agreement of the Contractor therewith, including adjustment in Contract Sum and Contract Time or the method for determining them. Such agreement shall be effective immediately and shall be recorded as a Change Order.
3. **Minor Changes in the Work**

The Engineer will have authority to order minor changes in the Work not involving adjustment in the Contract Sum or extension of the Contract Time and not inconsistent with the intent of the Contract Documents. Such changes shall be effected by written order and shall be binding on the Owner and Contractor. The Contractor shall carry out such written orders promptly.

**Performance and Payment Bonds**

1. Contractor shall furnish to the Owner performance and payment bonds, each in an amount at least equal to the Contract Price as security for the faithful performance and payment of all of Contractor’s obligations under the Contract Documents. These bonds shall remain in effect until one (1) year after the date when final payment becomes due.

2. All bonds shall be in the form as prescribed by the Owner except as provided otherwise by Laws or Regulations, and shall be executed by such sureties as are named in the list of “Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies” as published in Circular 570 (amended) by the Financial Management Service, Surety Bond Branch, U.S. Department of the Treasury. All bonds signed by an agent or attorney-in-fact must be accompanied by a certified copy of that individual’s authority to bind the surety. The evidence of authority shall show that it is effective on the date the agent or attorney-in-fact signed each bond.

**Insurance Coverage**

Contractor shall maintain for the duration of the contract all required insurance coverages as set forth below. Coverage shall be written with an insurance carrier licensed to do business in the State of New Hampshire, listed with A.M. Best as no less than A:VII-rated. Contractor shall provide to Owner Certificates of Coverage for all coverages no fewer than ten (10) days prior to commencement of the Work, which certificates shall include language that coverage provided by the policies shall not be reduced or canceled without thirty (30) days advance written notice given to Owner. Notwithstanding the above, in the event of cancellation for non-payment of premium or other event for which coverage may be terminated on ten (10) days notice to the policyholder, no less than ten (10) days advance written notice shall be given to Owner.

1. **Comprehensive General Liability**, including Completed Operations Coverage - $1,000,000 per occurrence/$2,000,000 Aggregate – City of Claremont must be named as an additional insured.

2. **Motor Vehicle Liability** - $1,000,000 combined single limit – City of Claremont must be named as an additional insured. Coverage must include all owned, non-owned and hired vehicles.

3. **Worker’s Compensation** on all workers providing services under this Agreement; Employer’s Liability with limits in an amount no less than $100,000/$500,000/$100,000.
4. All Subcontractors, as agents of Contractor under this Agreement, are subject to the same insurance requirements as the Contractor.

5. Excess Liability Coverage in an amount no less than $5,000,000. Contractor shall indemnify and hold harmless Owner, its agencies, officials and employees, from and against all claims, causes of action at law or in equity, damages, penalties, loss or expenses, including attorney’s fees arising out of or related to the performance of the Work, provided that any such claim, cause, damage, penalty, loss or expense: (a) is attributable to bodily injury, personal injury, sickness, disease or death, or to injury or destruction of tangible property (other than the Work itself) including the loss of use resulting therefrom; and (b) is caused in whole or in part by any negligent act or omission of Contractor, any Subcontractor, anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, regardless of whether or not it is caused in part by a party indemnified hereunder and regardless of whether or not the negligent act or omission is discovered during or subsequent to completion of the Project.

**Miscellaneous**

By signing this Agreement, Contractor represents that Contractor has visited the site, is familiar with local conditions under which the Work is to be performed and has incorporated Contractor’s personal observations with requirements of the Contract Documents.

This Agreement represents the entire agreement between the parties and supersedes prior negotiations, representations or agreements, either written or oral. The Agreement may be amended or modified only in writing, signed by both parties.

The Agreement shall be governed by the laws of the State of New Hampshire. Any dispute arising from the Agreement shall be settled in a court within the jurisdiction of the State of New Hampshire.

Neither party to the Agreement shall assign the Agreement or any portion of the Work required by the Contract Documents without the express written consent of the other.

**Termination by the Contractor**

Contractor may terminate this Agreement upon fifteen (15) days written notice to Owner if Owner fails to remit payment when due or substantially breaches any other obligation of this Agreement. If Owner does not remedy such default within ten (10) business days, the Agreement shall terminate and Contractor may recover from Owner payment for Work executed through the date of termination.

**Termination by the Owner**

Owner may terminate the Agreement upon fifteen (15) days written notice to Contractor if Contractor substantially breaches any obligation of this Agreement or for any of the following, which acts shall constitute events of default:
1. Persistent or repeated refusal or failure to supply adequate, properly skilled workers or proper materials;

2. Failure to make payments to Subcontractors for materials or labor in accordance with the respective agreements between the Contractor and Subcontractors;

3. Failure to observe laws, ordinances, rules, regulations or orders of a public authority having jurisdiction;

4. Failure to perform any requirement as set forth in the Contract Documents, except where such failure is agreed to by Owner, or except where Contractor has no control over such performance or completion;

5. Contractor shall file or have filed on its behalf, either on a voluntary or involuntary basis, a petition for adjudication as a bankrupt, for reorganization under any provision of state or federal bankruptcy laws or regulation, or shall make an assignment for the benefit of creditors.

Prior to any such Termination taking effect, Owner agrees to meet with Contractor to discuss the cause for Termination and work in good faith with Contractor to resolve the issue(s) in order to avoid any such Termination.

When any of the above reasons exist, and the issues are not resolved by a good faith meeting between the parties, Owner may, without prejudice to any other rights or remedies of the Owner, and, after giving the Contractor and the Contractor’s surety, if any, seven (7) days written notice, terminate the Agreement, and Owner may:

1. Take possession of the Work and of all materials thereon owned by the Contractor;

2. Complete the Work by whatever reasonable method Owner may deem expedient.

If Owner terminates the Agreement, Contractor shall be paid for the value of the non-breaching services provided under the Agreement through the date of termination.

City of Claremont (Owner)

______________________________   ______________________________
(signature)                      (signature)

Ryan W. McNutt, City Manager   (Printed Name and Title)

______________________________   ______________________________
Date                             Date
Schedule A

Description of Services

Services will include, but not be limited to:

Reconstruction of the Rice Reservoir Spillway at the Rice Reservoir Dam in the City of Claremont, NH. This work will include, but not be limited to:

1. Installation of temporary erosion control measures at the toe of the dam and around portions of Steven’s Brook and a cofferdam at the entrance to the existing and new spillway structures.

2. Removal of trees and other vegetation in the area of the new spillway.


5. Installation of approximately 160 feet of a new section of 16-inch PVC waterline and associated fittings. This section of waterline runs under the existing spillway and the new proposed spillway.

6. Filling and grading of the area occupied by the existing spillway.

7. Installation of a toe drain system in the area of the excavation for the new waterline.

8. Construction of an energy dissipating rip-rap structure at the terminus of the new spillway.

9. Final re-grading of the embankment, loaming, seeding, and miscellaneous work including, but not limited to, concrete patching.

10. Final clean-up.
These services shall be performed in accordance with the technical specifications attached to this agreement and as indicated on the plans entitled: “City of Claremont, New Hampshire, Dam #047.014, Rice Reservoir Dam, Claremont, New Hampshire” consisting of the following sheets:

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<td>C2.0</td>
<td>SPILLWAY REPLACEMENT PLAN</td>
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<td>SK3</td>
<td>ENVIRONMENTAL IMPACT PLAN</td>
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SECTION 01010

SUMMARY OF WORK

PART 1  GENERAL

1.1  DESCRIPTION OF WORK

A. This project consists of, but is not limited to:

1. Reconstruction of the Rice Reservoir Spillway at the Rice Reservoir Dam in the City of Claremont, NH. This work will include, but not be limited to:

a. Installation of temporary erosion control measures at the toe of the dam, around portions of Steven’s Brook and a cofferdam at the entrance to the existing and new spillway structures.

b. Removal of trees and other vegetation in the area of the new spillway.

c. Construction of a new concrete inlet structure.

d. Construction of a new rock-lined spillway structure by excavating the existing rock.

e. Installation of approximately 160 feet of a new section of 16-inch PVC waterline and associated fittings. This section of waterline runs under the existing spillway and the new proposed spillway.

f. Filling and grading of the area occupied by the existing spillway.

g. Installation of a toe drain system in the area of the excavation for the new waterline.

h. Construction of an energy dissipating rip-rap structure at the terminus of the new spillway.

i. Final re-grading of the embankment, loaming, seeding, and miscellaneous work including, but not limited to, concrete patching.

j. Final clean-up.

B. Refer to project drawings as well as these project specifications for additional descriptions of work to be performed.
1.2 CONSTRUCTION SAFETY/HEALTH

A. The Contractor, in all cases, shall be responsible for the safety of all persons involved on this project, and shall comply with OSHA, EPA, State of New Hampshire and all other applicable local, state, and federal agencies.

1.3 SANITARY FACILITIES

A. Portable sanitary facilities shall be provided by the Contractor in numbers adequate for the work force on-site in a location approved by the Owner.

1.4 INSTALLATION

A. All work shall conform to the Contract Documents, and applicable local, state, and federal requirements. Unless specified herein, contract work shall conform to Manufacturer's recommendations.

1.5 PROTECTION

A. Contractor to be responsible for the protection of all existing roadway components, utilities, fencing, concrete pads, buildings, retaining walls, building finishes, building components, hydrants, trees, shrubs, grassed areas, etc., during all phases of the work.

1.6 RESTORATION

A. All structures, facilities, finishes, utilities, etc., or landscaped or paved areas damaged during the duration of the work shall be restored by the Contractor to a condition acceptable to the Owner prior to final payment.

1.7 COORDINATION WITH THE OWNER ON SITE ACCESS

A. All access to the work area shall be coordinated with the Owner prior to commencing the work.

B. Although the City is allowed access to the site through an adjacent lot, a privately owned residential property, this access route is strictly limited and available only through coordination with the City's Assistant DPW Director. The Contractor shall explore other means of access to the site through City owned property and shall take measure to protect the area of access as stipulated in paragraph 1.5 above.

PART 2 EXECUTION

Not used.

END OF SECTION
SECTION 01300

SUBMITTALS

PART 1 GENERAL

1.1 ALTERNATIVES

A. If alternative materials and/or methods are proposed; full substantiation must accompany the Bid.

1. Such alternatives must be listed in detail, with accompanying costs along with a concurrent listing of the items and their costs for which the alternatives are being proposed so that an accurate comparison and evaluation may be made by the Engineer.

1.2 CONSTRUCTION SCHEDULES

A. Planning and progress schedules shall be submitted to the Owner/Engineer by the Contractor at the time of the pre-construction conference. This schedule shall be updated by the Contractor on a monthly basis.

1. The Contractor shall also submit to the Owner/Engineer, at the end of each month, itemized estimates of work completed for the purpose of making partial payments thereon. The costs employed in preparing any of these schedules will be used only for determining the basis of partial payments, and will not be considered as fixing a basis for additions to, or deductions from, the contract price.

1.3 SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES

A. Special requirements for shop drawings and samples for various types of work are specified in the technical specifications notes on the project plans.

B. Shop drawings may include concrete reinforcing drawings, general assembly and detail drawings, diagrams, illustrations, material and equipment schedules with Manufacturer’s name and catalog numbers and description, performance charts, catalog cuts, brochures, and such other information and data as is necessary and required by the Engineer.

C. The Contractor shall submit to the Engineer a minimum of three (3) hard copies of all shop drawings and information submittals required for the work. In lieu of submitting hard copies, all submittals may be submitted electronically by e-mail in “pdf” format. All drawings and information shall contain sufficient and accurate data to ascertain item by item compliance.
with the Contract Documents. Incomplete, inadequate, or unidentified submittals will be rejected. The Engineer will examine submittals only after they have been properly identified, as specified herein, and signed by the Contractor to indicate that he has reviewed and endorsed them.

D. Shop drawings prepared by Subcontractors shall be submitted through the General Contractor’s office only, and shall be checked by the General Contractor before being forwarded to the Engineer, and so noted in writing by the General Contractor. It will be the General Contractor’s responsibility to coordinate the work of the various Subcontractors, whether or not shown on the shop drawings.

E. The Engineer will review the shop drawings and samples with reasonable promptness. The Contractor shall allow ten (10) calendar days for approval by the Engineer after receipt of shop drawings and samples. The Engineer’s review and approval shall be only for conformance with the design concept of the contract work and with information given in the plans and specifications. The Engineer’s approval of a separate item shall not indicate approval of an assembly in which the item functions. The Engineer’s approval shall not relieve the Contractor of responsibility for conforming to the plans and specifications. The Contractor is responsible for confirming and correlating all quantities, dimensions, fabrication details and techniques, installation methods and performance of the work. The Contractor shall check and verify all field measurements.

F. If required in the technical sections of these specifications, as soon as practicable, and not later than ten (10) days after the date of notice of award of the contract, but sufficiently in advance of commencement of installation of materials and equipment to allow for approval of the regular submission, the Contractor shall submit preliminary shop drawings in the form of material and equipment schedules which shall contain a completed list of materials, fixtures, and equipment to be incorporated in the work. No consideration will be given to partial lists submitted at different times. If any items in the list submitted differ from the item specified in the specifications and plans, the Contractor shall state that the substituted item is of the proper size for the allotted space, and will meet the performance requirements of the original item. After approval of the material and equipment schedules by the Engineer, the Contractor shall submit the regular submission of shop drawings.

G. The Contractor shall furnish the regular submission of shop drawings after the approval by the Engineer of the preliminary submission if such preliminary submission is required; otherwise, the regular submission of shop drawings shall be submitted to the Engineer with sufficient lead time to allow his review and return of the shop drawings to the Contractor before work is commenced on that portion of the project covered by the shop drawings.
H. If the shop drawings are not approved by the Engineer, the Contractor shall correct or make changes as noted, and shall resubmit revised shop drawings until approved by the Engineer.

I. To facilitate review, the Contractor shall number consecutively each submittal. This numbering system shall be in order of submittal and should not necessarily follow the order of listing in the Special Requirements. Any resubmittal required shall have the same number as the original submittal, followed by a notation signifying that it is the second (or third, etc.) submission of that particular submittal.

END OF SECTION
SECTION 01900

PERMITS

PART 1  GENERAL

1.1  RESPONSIBILITY

A. The Owner has obtained a Permit for Reconstruction of the dam from the NHDES Dam Bureau for the project. The Contractor shall be supplied with a copy of the permit and shall be responsible for complying with all conditions of the permit.

B. The Owner has obtained a Wetlands Permit from the NHDES Wetlands Bureau for the work to be performed as part of this project. The Contractor shall be supplied with a copy of the permit and shall be responsible for complying with all conditions of the permit.

C. The Contractor shall be responsible for obtaining all building and other local permits required of his equipment, work force, or particular operations.

END OF SECTION
PART 1 GENERAL

1.1 WORK INCLUDED

A. Site preparation consisting of stripping and stockpiling topsoil, removing soil as indicated on the plans, rock excavation, filling depressions, overall grading, etc.

B. All excavation and compaction necessary to successfully complete this project.

C. Control of water, dewatering, and maintaining dewatered conditions in work areas.

D. Earthwork required for all miscellaneous site work shown in the project documents.

1.2 REFERENCE STANDARDS

A. Grain size testing of fill materials shall be performed in accordance with ASTM D 422 and D 1140, latest revisions.

B. Maximum soil dry unit weight and optimum soil moisture shall be determined in accordance with ASTM D 2216, latest revision.

C. Compaction per the Modified Procter Test ASTM D 1557, latest revision.

D. Organic content test per ASTM D 2974, latest revision.

E. PH tests per ASTM D 4972, latest revision.


1.3 SUBMITTALS

A. Submit copies of the grain size analyses of each fill material to be used on-site to the Engineer.

B. Submit copies of maximum soil dry unit weight and optimum soil moisture content.
1.4 QUALITY ASSURANCE

A. The Contractor shall have sole responsibility for ensuring that the work is performed in accordance with the Contract Documents. The Contractor shall report to the Engineer any conditions which will prevent proper completion of the work.

B. The work shall be subject to observations by representatives of the Owner and Engineer for the purpose of detecting, recognizing, and reporting of deficiencies in materials or workmanship, or noncompliance with applicable plans and specifications. The presence of the Owner or Engineer, however, shall not relieve the Contractor of the responsibility for the proper execution of the work in accordance with all requirements of the Contract Documents. Compliance is distinctly a duty of the Contractor, and said duty shall not be avoided by any act or omission on the part of the Inspector(s). All materials and articles furnished by the Contractor shall be subject to inspection and testing by the Engineer’s or the Owner’s Inspector. Field tests required under these specifications shall be performed at the Owner’s expense. The Engineer shall have the right to reject any materials which fail to meet the requirements of these specifications.

1.5 SITE CONDITIONS

A. The Contractor acknowledges that he has satisfied himself as to the nature and location of the work, the general and local conditions, particularly those bearing upon site access, transportation, disposal, handling and storage of materials, availability of labor, water, electric power, roads and uncertainties of weather, groundwater table, or similar physical conditions at the site, the conformation of subsurface materials to be encountered, including materials as indicated by subsurface borings or test pits, the character of equipment and facilities needed prior to and during the prosecution of the work, and all other matters which can in any way effect the work or the cost thereof under this contract. Any failure by the Contractor to acquaint himself with all available information concerning these conditions will not relieve him from the responsibility for estimating properly the difficulty or cost of successfully performing the work.

1.6 PROTECTION AND RESTORATION OF EXISTING FACILITIES

A. The Contractor shall protect all areas of the site and existing facilities not designated for alteration, and shall restore damaged areas to a condition equal to, or better than, they were prior to such damage.

B. Vegetative cover beyond the limits of the alterations shall remain intact as much as possible. The Contractor shall carry out his work in a manner
that minimizes equipment activity, and material storage in areas beyond the limits of the alterations.

C. All debris, excavated soil not utilized on-site, and excess construction materials shall become the property of the Contractor and shall be removed from the immediate work area and disposed of by the Contractor in an appropriate and legal manner.

PART 2 MATERIAL SPECIFICATION

2.1 GENERAL

A. The materials used for the repairs and modifications to the Rice Reservoir Dam shall meet the specifications identified on the Project Drawings. Any variations from the specifications must be approved by the Engineer in writing prior to use of the material on the project.

PART 3 EXECUTION

3.1 SITE PREPARATION

A. Site preparation includes stripping topsoil from the project site as necessary.

B. Removal of soil in the area around the spillway structure.

C. Excavation of rock in the area of the new spillway structure and for the new spillway.

D. Topsoil removed from the embankment shall be temporarily stockpiled on-site for reuse after construction is completed.

E. The Contractor shall be responsible for dewatering any excavations and/or providing drainage berms as necessary to maintain the construction free of groundwater or surface water. The Contractor shall maintain groundwater levels at least one foot below bottom of excavations.

3.2 COMPACTATION, TESTING, AND CONTROLS

A. Compaction:

1. Fills, refills, and backfills: See Project Drawings and the Construction Inspection Plan for compaction requirements.

B. Environmental Controls:

1. The Contractor shall be responsible for exercising every precaution to prevent the silting of downstream watercourses by
constructing and maintaining effective erosion and sediment control measures.

C. In areas where portions of the embankment are removed, proof-roll remaining embankment by at least three coverages of a vibratory roller compactor imparting a combined weight and dynamic force of 30 kips. Where fill needs to be placed, it shall be placed in maximum 12-inch thick lifts and compacted in a similar manner. Thinner lift thicknesses of 4 to 6 inches shall be used in areas compacted by a vibratory plate or mechanical tamper.

D. All lifts shall be installed in long, continuous lengths, as opposed to short, intermittent sections.

E. When backfilling against an existing slope, bench each lift into the slope to make a uniform transition.

F. Place fill lifts in a manner to avoid segregation of particle sizes.

G. Special care is needed to ensure proper compaction of fill against structures to avoid loose zones that could lead to the formation of preferential seepage paths. Backfill placed within two feet of a structure shall have no stones greater than 1-inch. Ramp backfill lifts up against the structure on a minimum 10H:1V slope. Where vibratory plates or mechanical tampers are used, loose lift thickness should not exceed 6 inches.

3.3 INFILLING OF EXISTING SPILLWAY

A. Excavated soil and rock resulting from the excavation of the new bedrock spillway section may be reused to fill within the existing concrete spillway providing that it is free from ice and snow, roots, stumps and other deleterious materials and consists of silt, sand, gravel, angular sized cobbles and boulders (less than 18 inches in size) created from the on-site blasted, chipped or otherwise excavated bedrock and/or crushing operations and meet the following requirements:

<table>
<thead>
<tr>
<th>Sieve Size</th>
<th>Percent Finer by Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>18-inch</td>
<td>100</td>
</tr>
<tr>
<td>12-inch</td>
<td>90-100</td>
</tr>
<tr>
<td>6-inch</td>
<td>55-95</td>
</tr>
<tr>
<td>2-inch</td>
<td>35-75</td>
</tr>
<tr>
<td>No. 4</td>
<td>5-45</td>
</tr>
<tr>
<td>No. 200</td>
<td>0-20</td>
</tr>
</tbody>
</table>
B. All compacted rock fill should be placed in loose lifts not exceeding 24 inches in thickness, and should be compacted by a minimum of six passes of a steel sheepsfoot roller having a down force with vibratory of at least 20,000 pounds. All compacted rock fill should be dumped on the lift of elevation currently being constructed and worked into place for compaction. Water should be added during compacted rock fill placement to control dust and to aid in compaction. Water should be added by spraying on dumped rock fill before spreading as necessary.

3.4 GRADING

A. Rough grading shall include the shaping, trimming, rolling, and finishing the surface of the subbase, shoulders, and earth slopes, and the preparation of subbase for loam and seeding. The grading of shoulders and sloped areas may be done by machine methods. Up to 2 inches in 10'-0" tolerance will be permitted on slopes, and 1-inch in 10'-0" on top of the dam, provided the graded areas are uniform in appearance and without abrupt changes. All ruts shall be eliminated.

B. Do all other cutting, filling, and rough grading to the lines and grades indicated on the drawing. Grade evenly to within the dimensions required for finished grades shown on the drawings. No stone larger than 3 inches in largest dimension shall be placed in upper 6 inches of fill.

C. No rubbish of any description shall be allowed to enter fill material. Such material shall be removed from the site.

D. The areas to be fine graded for loaming shall be raked to remove all stones and other unsatisfactory material, and shall then be rolled. Any depressions, which may occur during the rolling, shall be filled with additional suitable material and the surface regraded and rerolled until true to the lines and grades required. Care shall be taken not to affect the line or grade of walls and footings during grading and rolling operations.

END OF SECTION
SECTION 02500
FILTERED TOE DRAIN

PART 1 GENERAL

1.1 WORK INCLUDED

A. Installation of filtered toe drain piping, filter material, and loam and seed all as shown in the project documents.

1.2 RELATED WORK

A. Earthwork. See Section 02200.

1.3 REFERENCE STANDARDS


1.4 SUBMITTALS

A. Submit product data on pipe and geotextile in accordance with Section 01300.

1.5 QUALITY ASSURANCE

A. The Contractor shall have sole responsibility for ensuring that the work is performed in accordance with the Contract Documents. The Contractor shall report to the Engineer any conditions which will prevent proper completion of the work.

B. The work shall be subject to observations by representatives of the Owner and Engineer for the purpose of detecting, recognizing, and reporting of deficiencies in materials or workmanship, or noncompliance with applicable plans and specifications. The presence of the Owner or Engineer, however, shall not relieve the Contractor of the responsibility for the proper execution of the work in accordance with all requirements of the Contract Documents. Compliance is distinctly a duty of the Contractor, and said duty shall not be avoided by any act or omission on the part of the inspector(s). All materials and articles furnished by the Contractor shall be subject to inspection and testing by the Engineer's or the Owner's inspector. Field tests required under these specifications shall be performed at the Owner’s expense. The Engineer shall have the right to reject any materials which fail to meet the requirements of these specifications.
PART 2 MATERIAL SPECIFICATION

2.1 GENERAL

A. The materials used for the repairs to the Rice Reservoir Dam Project shall meet the specifications identified on the project drawings. Any variations from the specifications must be approved by the Engineer in writing prior to use of the material on the project.

B. Pipe and fittings for the toe drain shall be perforated underdrain, 6-inch polyethylene slotted corrugated single wall drain pipe meeting ASTM F405, ASTM F667, AASHTO M252 and AASHTO M294. Slots shall be randomly oriented with a length less than .984 inches and a width less than .114 inches.

C. End sections shall be of the same material and manufacturer as the pipe, and shall be high density polyethylene meeting the requirements of ASTM D-1248.

PART 3 EXECUTION

3.1 INSTALLATION

A. Site preparation and excavation shall be in accordance with Section 02200 Earthwork.

B. Remove soil in area of filtered toe drain construction.

C. Install pipe, graded filter material, and loam and seed as indicated on the drawings.

END OF SECTION
SECTION 02540
EROSION CONTROL

PART 1 GENERAL

1.1 WORK INCLUDED
A. Installation and maintenance of erosion and sediment control measures.
B. Mulching of disturbed soils.
C. Erosion control seeding.

1.2 RELATED WORK
A. Permits. See Section 01900.
B. Earthwork. See Section 02200.
C. Loaming and Seeding. See Section 02820.

1.3 REFERENCE STANDARDS
A. Comply with the provisions of the following except as otherwise indicated:
   1. New Hampshire Department of Environmental Services
      During Construction.”
   2. State of New Hampshire Department of Transportation, “Standard
      Specifications for Road and Bridge Construction”, Sections 645
      and 699. Paragraphs in these sections titled “Methods of
      Measurement” and “Basis of Payment” shall not apply.

1.4 SUBMITTALS
A. Product data sheets.
B. Seed mixes.

PART 2 PRODUCTS

2.1 SILT FENCING
A. Silt fence for erosion control shall consist of a durable, ultraviolet light
   resistant fabric attached to posts a maximum of 8 feet on-center. Silt
   fencing shall be Mirafi 100X or equivalent.
2.2 MULCH

A. Mulch shall consist of cured hay or straw. When air dried in the loose state, the contents of a representative bale shall lose no more than 15 percent of the resulting air dry weight of the bale. It shall be free from primary noxious weed seeds and rough or woody materials.

2.3 EROSION CONTROL SEED

A. Seed for erosion control shall be one of the following:
   1. Seed for temporary control shall be annual ryegrass, or winter rye as approved by Engineer.
   2. Seed for permanent control shall be seed as set forth in Section 02820.

PART 3 EXECUTION

3.1 GENERAL

A. The Contractor shall note the various erosion and sedimentation control devices and measures specified herein. The Contractor will be required to control all erosion and sedimentation using these devices, and by employing additional acceptable means. The Contractor will be held fully responsible for all damages arising from erosion and/or sedimentation.

B. Prior to the start of the construction, the Contractor shall submit for acceptance his written schedules for accomplishment of temporary and permanent erosion and sediment control work, as are applicable for clearing and grubbing, grading, construction, and paving. He shall also submit for acceptance his proposed method of erosion and sediment control around the site in written form. No work shall be started until control schedules and methods of operations have been accepted by the Engineer.

3.2 CONSTRUCTION

A. The Engineer has the authority to order immediate, additional, permanent, or temporary control measures to prevent contamination of adjacent areas.

B. The Contractor will be required to incorporate all permanent erosion and sediment control features into the project at the earliest practical time as outlined in his accepted schedule. Temporary erosion and sediment control measures will be used to correct conditions that develop during construction which were unforeseen during the design stage, that are needed prior to installation of permanent control features, or that are
needed temporarily to control erosion of sedimentation that develops during normal construction practices.

C. The erosion and sediment control features installed by the Contractor shall be satisfactorily maintained by the Contractor until acceptance.

D. In the event of conflict between these specifications and laws, rules or regulations of local agencies, the more restrictive requirements shall apply.

E. Failure by the Contractor to control erosion, pollution, and/or siltation shall be cause for the Owner to employ outside assistance, or to use his own forces to provide the necessary corrective measures. The cost of such assistance, plus project engineering costs will be charged to the Contractor and appropriate deductions made to the Contractor’s monthly progress estimate.

F. The Contractor shall remove sediment from erosion control facilities as required and as directed by the Engineer. The Contractor shall modify and/or improve erosion control facilities and replace deteriorated devices as directed by the Engineer.

G. Temporary and permanent erosion and sedimentation control measures are shown in detail. The Contractor will be required to strictly adhere to the provisions. Additionally, temporary measures shall be constructed to correct field conditions that develop during construction.

H. Grading taking place as the site is excavated and filled shall be done in a manner to allow drainage to be conveyed toward the siltation fencing. Concentrated runoff shall not be permitted to overflow newly constructed slopes.

I. After final grading of the embankments, these areas will be re-vegetated.

J. Hay mulch or erosion control matting shall be applied to all slopes and embankments upon completion of grading and prior to final landscaping and re-vegetation.

3.3 SILT FENCE

A. Silt fences shall be installed to control sedimentation. Posts shall be installed a maximum of 8 feet on-center. The fences shall be set approximately one (1) foot in the ground to secure the bottom.
3.4  MULCH

A. Mulching shall be done immediately after each area has been properly prepared. When seed for erosion control is sown prior to placing the mulch, the mulch shall be placed on the seeded areas within eight (8) hours after seeding. Hay that has been thoroughly fluffed shall be applied at approximately, but not to exceed, three (3) tons per acre unless ordered. Blowing chopped mulch will be permitted when authorized. Hay mulch should cover the ground enough to shade it, but the mulch should not be so thick that a person standing cannot see ground through the mulch. Matted mulch or bunches shall be removed or otherwise taken care of.

B. In order to prevent it from being blown away, after the mulch has been spread to the required depth, it shall be anchored by mechanical means using a mulch anchoring tool to properly crimp the mulch to a depth of 2 to 3 inches into the soil, or by the use of a liquid mulch binder approved by the Engineer.

3.5  SEED FOR EROSION CONTROL

A. Seeding, when required, shall be performed as ordered and in accordance with Section 02820.

1. Areas of the site which are to be left temporarily and which will be regraded or otherwise disturbed later during construction, may be ordered to be seeded with annual ryegrass to obtain temporary control. The seed shall be sown at the rate of approximately 1 pound per 1,000 square feet.

END OF SECTION
SECTION 02820
LOAMING AND SEEDING

PART 1  GENERAL

1.1  WORK INCLUDED

A. Preparation of subgrade to receive topsoil.
B. Spreading topsoil.
C. Seeding and fertilizing.
D. Maintaining seeded areas until acceptance.

1.2  RELATED WORK

A. Earthwork. See Section 02200.
B. Erosion Control. See Section 02540.

1.3  REFERENCE STANDARDS

A. Comply with the provisions of the following except as otherwise specified:

1. State of New Hampshire Department of Transportation “Standard Specifications for Road and Bridge Construction,” Sections 641, 642, 643, 644, 645 and 646. Paragraphs in this section titled “Methods of Measurement” and “Basis of Payment” shall not apply.

1.4  DELIVERY, STORAGE, AND HANDLING

A. Deliver grass seed in original containers showing analysis of seed mixture, percentage of pure seed, year of production, net weight, date of packaging, and location of packaging. Damaged packages will not be accepted.

B. Deliver fertilizer in waterproof bags showing weight, chemical analysis, and name of Manufacturer.

PART 2  PRODUCTS

2.1  TOPSOIL

A. Existing topsoil separated from excavated material and stored shall be approved by the Engineer before reuse. Topsoil separated and stored shall be treated as specified herein. Topsoil stockpiled shall be used in its entirety.
B. Imported topsoil shall be a natural, fertile, friable, agricultural soil typical of the locality, capable of sustaining vigorous plant growth from a well drained site free of flooding, not in a frozen or muddy condition. The soil shall be free from subsoil, slag, stones, and objects larger than 2 inches in diameter, live plants, roots, sticks, crabgrass, couchgrass, noxious weeds, and any foreign matter.

C. Modify topsoil to supply 6% organic matter and a pH value of 5.9 to 7.5. Soil conditioners shall include any of the following either singly or in combination: compost peat, sand, rotten manure or calcined clay.

2.2 LIMESTONE

A. Limestone shall be raw, ground, agricultural limestone containing not less than 90% calcium carbonate, and shall be ground to such a fineness that 50% will pass through a 100 mesh sieve and 90% will pass through a 20 mesh sieve.

2.3 FERTILIZER

A. Fertilizer shall be a commercial type with 50% of the elements derived from organic sources. The chemical analysis and compositions by weight shall be 10% nitrogen, 10% phosphorus, and 10% potash.

2.4 SEED

A. Seed shall be the commercial product of a reputable Manufacturer approved by the Engineer, and shall be certified to be not more than one (1) year old. Seed shall be NHDOT Park Seed Type 15 conforming to the following general proportions by weight:

<table>
<thead>
<tr>
<th>PARK SEED TYPE 15</th>
<th>Kind of Seed</th>
<th>Minimum Purity (%)</th>
<th>Minimum Germination (%)</th>
<th>Lbs./Acre</th>
</tr>
</thead>
<tbody>
<tr>
<td>Red Fescue (3)</td>
<td>96</td>
<td>85</td>
<td>40</td>
<td></td>
</tr>
<tr>
<td>Perennial</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ryegrass (1)</td>
<td>98</td>
<td>90</td>
<td>50</td>
<td></td>
</tr>
<tr>
<td>Kentucky Bluegrass (2)</td>
<td>97</td>
<td>85</td>
<td>25</td>
<td></td>
</tr>
<tr>
<td>Redtop</td>
<td>95</td>
<td>80</td>
<td>5</td>
<td></td>
</tr>
</tbody>
</table>

Total 120

(1) Ryegrass shall be a certified fine textured variety such as Pennfine, Fiesta, Yorktown, Diplomat, or equal.

(2) Bluegrass shall be a certified variety such as Merion, Baron, Majestic Touchdown, Nugget, Ram One, or equal.
(3) Fescue varieties shall include: Creeping Red and/or Hard Reliant, Scaldis, Koket or Jamestown.

B. The seed shall be furnished and delivered pre-mixed in the proportions specified above. All seed shall comply with State and Federal seed laws. A Manufacturer's certificate of compliance with the specifications shall be submitted by the Manufacturer with the shipment of the seed. The certificate shall include the guaranteed percentage of purity, weed content, and germination of the seed, and also the net weight and date of shipment. No seed shall be sown until the Contractor has submitted the certificate to the Engineer.

PART 3 EXECUTION

3.1 TOPSOIL

A. Topsoil or loam shall be spread on the designated areas so as to form a cover of topsoil to a depth of four (4) inches unless otherwise shown on the drawings or directed by the Engineer. Areas designated for covering with topsoil shall be scarified or otherwise roughened, just prior to the application of topsoil.

B. Topsoil or loam remaining after spreading will be stockpiled in designated areas, will not be removed from the site, and will become the property of the Owner.

3.2 SEEDBED PREPARATION

A. Grade turf areas to finish grades, filling as needed or removing surplus dirt, and floating areas to a smooth uniform grade as indicated on grading plans. All turf areas shall slope to drain.

B. Where no grades are shown, areas shall have a smooth and continual grade between existing or fixed controls (such as walks, curbs, catch basins, elevations at steps, or building), and elevations shown on plans. Roll, scarify, rake, and level as necessary to obtain true, even turf surfaces. All finish grades shall meet approval of the Engineer before grass seed is sown.

C. Loosen topsoil to a depth of four (4) inches, unless otherwise indicated on the plans, in turf areas by approved method of scarification, and grade to remove ridges and depressions. Remove stones or foreign matter over two (2) inches in diameter from top two (2) inches of soil. Float turf areas to finish grades.

3.3 APPLICATION RATES OF FERTILIZER, pH ADJUSTERS, SOIL CONDITIONERS AND SEED

A. Fertilizer, pH adjusters, and soil conditioners shall be applied and thoroughly incorporated in the layer of loam or topsoil to a depth of four (4) inches.
B. Limestone shall be applied at a rate not-to-exceed 45 pounds per 1,000 square feet.

C. Fertilizer shall be applied at the minimum rate of 20 pounds per 1,000 square feet.

D. The seed mixture shall be sown at the rate of 5 pounds per 1,000 square feet.

E. The Engineer reserves the right to vary the amounts of materials used as required to produce the intended results.

3.4 FERTILIZING AND LIMING

A. Fertilizing and liming shall be done when the soil is in a moist condition and at least 24 hours before the sowing of seed. The fertilizer and lime shall be applied to the soil by means of a mechanical spreader or other approved method capable of maintaining a uniform rate of application, and shall be thoroughly harrowed, raked, or otherwise mixed with the soil to a depth of no less than 4 inches. The fertilizer and lime shall not be applied together, unless approved by Engineer.

3.5 TIME OF SEEDING

A. The recommended seeding periods are from April 1st to June 1st, and from August 15th to October 1st. The Contractor may seed at other times. Regardless of the time of seeding, he shall be responsible for a full growth of grass. When directed, he shall refertilize and reseed areas on the project which do not develop a satisfactory growth of grass. Refertilizing and reseeding shall be incidental to the original seeding item requirements.

3.6 SEEDING METHODS

A. Fertilizer, limestone, and mulch material, if required, and seed of the type specified, may be placed at the locations shown or ordered by one of the following methods, provided an even distribution is obtained.

3.7 DRY METHOD

A. Power Equipment:

1. Mechanical seeders, seed drills, landscape seeders, cultipacker seeders, fertilizer spreaders, or other approved mechanical seeding equipment or attachments may be used when seed, limestone, and fertilizer are to be applied in dry form.
B. Manual Equipment:

1. On areas which are inaccessible to power equipment, permission may be given to use hand operated mechanical equipment when the materials are to be applied in dry form. The use of hand shovels to spread the materials will not be allowed.

C. When the dry method is used, limestone and fertilizer shall not be mixed together prior to their application, but they shall be worked into the soil together to the depth of at least 2 inches.

D. At least 24 hours shall elapse between the time fertilizer is incorporated and the seed is planted.

E. Loamed areas or areas covered with park seed shall be raked, and unless rolling is ordered omitted, shall be rolled with a roller weighing no more than 100 pounds per foot of roller width to firm the soil, but not to pack it. The rolling shall be done the same day as the seeding unless otherwise permitted.

F. Lawn areas constructed in Spring after April 15th shall be covered with a 1-inch loose layer of clean wheat or oat straw. Straw shall be kept wet until a catch of grass is established. Remove loose straw from the site.

3.8 WET METHOD

A. The application of grass seed, fertilizer, limestone, and a suitable mulch, if approved by the Engineer, may be accomplished in one operation by the use of an approved spraying machine.

B. The materials shall be mixed with water in the machine and kept in an agitated state in order that the materials may be uniformly suspended in the water.

C. The spraying equipment shall be so designed that when the solution is sprayed over an area, the resulting deposits or limestone, fertilizer, and grass seed shall be equal to the required rates.

D. Prior to the start of work, the Engineer shall be furnished with a certified statement for approval as to the number of pounds of materials to be used per 100 gallons of water. This statement shall also specify the number of square feet of seeding that can be covered with the quantity of solution in the hydroseeder.

E. The hydraulic seeding and fertilizing machine shall be completely flushed and cleaned each day before seeding is to be started.

F. If the results of the spray operations are unsatisfactory, the Contractor will be required to abandon this method and apply the materials in accordance with the dry method.
G. When the hydraulic method is used, compaction or rolling will be required.

H. Mulch material is applied during the seeding operation or within a 1/2 hour following the seeding operation. Temporary and satisfactory measures to protect the seed from sunlight and heat shall be taken, such as the use of a light brush drag over the seeded areas to stir the seed into the soil. Care shall be taken not to carry the seed ahead.

3.9 MAINTENANCE

A. The Contractor shall be responsible for the proper care of the seeded areas during the period when the grass is becoming established. This period shall extend to the date of substantial completion or two months after the completion of seeding on the entire project, whichever is the later date. The Contractor shall reseed all areas as necessary to obtain a uniform stand of grass, free from sizable areas of thin or bare spots, with a uniform count of at least 100 plants of grass per square foot.

1. Any parts of seeded areas which fail to show a uniform stand shall be reseeded until all areas are covered with grass at the Contractor’s expense.

B. If necessary, barricades of brush or other materials and suitable signs shall be placed to protect the seeded areas.

C. The seeded areas shall be carefully and suitably watered as necessary to produce a satisfactory growth.

D. Areas seeded shall be mowed whenever necessary to keep the growth between 3 inches and 6 inches in order to allow light to penetrate to the shorter, slower growing species in the mixture.

3.10 EROSION PROTECTION

A. The Contractor shall take all necessary steps to insure that exposed areas shall not be eroded.

B. Work areas shall be confined to small areas at a time and shall be treated as soon as practical.

C. Temporary hay bales shall be placed where required to prevent the movement of materials.

D. If necessary, temporary mulch cover or annual slope seed shall be applied to susceptible areas.

E. If required, annual seed shall be added to normal seed to insure rapid establishment of cover.

END OF SECTION
SECTION 03001

CONCRETE WORK

PART 1 GENERAL

1.1 WORK INCLUDED

A. Formwork, complete with required shoring and bracing.

B. Cast-in-place concrete, including mix design submittals identified herein.

C. Concrete reinforcing steel, complete with required supports, spacers, and related accessories where required.

D. See all project drawings and specifications for all related work.

1.2 REFERENCE STANDARDS

A. Perform all cast-in-place concrete work in accordance with ACI 301 “Specifications for Structural Concrete for Building”, ACI 347 “Recommended Practice for Measuring, Mixing, Transporting, and Placing Concrete” complying with applicable provisions except as otherwise indicated.

B. Keep copy of ACI 301 in field office for duration of project.

1.3 TESTING AGENCY

A. The Owner will employ and pay for the services of a qualified, independent testing laboratory to perform inspection, sampling, and testing of cast-in-place concrete. Reference the Construction Inspection Plan for the number of cylinders to be taken and the frequency. Contractor to coordinate all visits of testing company with the Engineer prior to scheduling testing company.

B. Employment of the laboratory shall in no way relieve Contractor's obligations to perform the work of the contract.

C. Owner’s testing firm/laboratory will perform sampling and testing during concrete placement as follows:


2. Slump - ASTM C143, one test for each load at point of discharge.

3. Air Content - ASTM C31, one for each set of compressive strength specimens.
4. Temperature of the mix.

D. Provide free access to work and cooperate with appointed firm.

E. Tests of cement and aggregates may be performed to ensure conformance with requirements stated herein.

F. Five (5) concrete test cylinders will be taken for each day’s placement or for every 30 cubic yards placed on a given day.

1.4 SHOP DRAWINGS

A. Submit one (1) electronic copy, in pdf format, of shop drawings for the following:

1. Concrete design mix, including admixtures.

2. Reinforcing steel and accessories.

B. Design mixes shall be submitted with the required historical documentation or lab test results.

C. Mix Proportions and Design:

    Proportion mixes by either laboratory trial batch or field experience method, complying with ACI 211.1.

    1. Submit written report to Engineer for each proposed concrete mix at least fifteen (15) days prior to start of work. Do not begin concrete production until mixes have been reviewed and are acceptable to Engineer.

    2. Mix designs may be adjusted when material characteristics, job conditions, weather, test results, or other circumstances warrant. Do not use revised concrete mixes until submitted to and accepted by Engineer.

    3. Use air-entraining admixture in all concrete, providing no less than 4% or more than 8% entrained air.

E. Indicate bar sizes, spacings, locations, and quantities of reinforcing steel, bending and cutting schedules, and supporting and spacing devices.

F. Indicate pertinent formwork dimensioning, methods of construction, material, arrangement of joints, ties and shores, location of bracing and temporary supports, schedule of erection, and stripping.
PART 2 PRODUCTS

2.1 CEMENTS

A. Use only one brand and type of cement throughout project unless otherwise specified.

B. Cement: Portland type, ASTM C150, Type I or Type II.

2.2 AGGREGATES

A. Aggregates shall conform to requirements of ASTM C33.

B. Provide aggregates from one source of supply only.

C. Maximum aggregate size shall be no larger than one-fifth of the narrowest dimension between sides of forms, one-third of the depth of slabs, nor three-fourths of the minimum clear spacing between individual reinforcing bars or bundles of bars.

D. Stockpile the aggregates in a manner to protect them from contamination.

2.3 WATER

A. Water used as an ingredient in concrete shall be clean, potable, and free from injurious amounts of foreign matter.

2.4 ADMIXTURES

A. Add air entraining agent to concrete as indicated in ACI 301, Table 3.4.1. Comply with ASTM C260.

B. Admixtures shall conform to ASTM C494.

C. Admixtures may be used only when included in the original mix design and approved by the Architect/Engineer.

D. Calcium chloride shall not be used at any time.

2.5 STRENGTH

A. Provide concrete of following strength except where indicated otherwise.
B. Concrete shall develop an ultimate compressive strength of:

1. All concrete compressive strength (28 day): 4,000 psi.

2.6 DURABILITY

A. Add air-entraining agent to concrete mix; no less than 4% or more than 8% entrained air.

B. The water-cement ratio for each batch of concrete shall be in the range of .38 to .40.

2.7 SLUMP

A. Slump when consolidation by vibration: 4 inches.

2.8 REINFORCING STEEL

A. Plain reinforcing steel: 60 ksi yield grade; new deformed billet steel bars, conforming to ASTM A615.

2.9 ACCESSORIES

A. Cementitious Patching Mix:

1. One component, cementitious, pumpable, pourable concrete mix for performing structural repairs. Material shall have a high bond strength and shall be a non-shrinking, non-expansive mix with good freeze/thaw resistance capable of developing minimum compressive strength of 5,000 psi in 28 days. Sikacrete 211 Harris Construction Grout or approved equal.

B. Epoxy for Securing Dowels:

1. Hilti HIT HY-200 Injection Adhesive or approved equal.

PART 3 EXECUTION

3.1 SELECTION OF PROPORTIONS

A. Selection of proportions for normal weight concrete: Method 1, “Trial Batch” or Method 2 “Field Test Data” may be used.

3.2 FORMWORK

A. Conform with ACI Standard 301 4.2, except as otherwise specified herein.
B. Construct forms and screeds rigid, plumb, true to line, shape and dimensions, and in precise position to form lines and designs indicated and required. Construct forms so as to be removable without prying against the concrete. Make forms and screeds tight so as to prevent leakage of mortar and fine particles from concrete.

C. The Contractor shall assume full responsibility for proper engineering, construction, and maintenance of forms and screeds, and for building in all necessary items to be built into or inserted in the formwork.

D. Chamfer all external corners.

3.3 FORM SURFACES PREPARATION

A. Apply form release agent on formwork in accordance with Manufacturer's recommendations. Apply prior to placing reinforcing steel, anchoring devices, and embedded parts.

3.4 REINFORCEMENT

A. Position, support, and secure reinforcement against displacement. Locate and support with metal chairs, runners, bolsters, spacers, and hangers as required. Set wire ties so ends are directed into concrete, not toward exposed concrete surfaces.

3.5 REPAIR OF SURFACE DEFECTS

A. Allow Engineer to inspect concrete surfaces immediately upon removal of forms.

B. Modify or replace concrete not conforming to required lines, detail, and elevations.

C. Repair or replace concrete not properly placed, resulting in excessive honeycombing and other defects. Repairs shall not be performed until methods have been approved by the Engineer.

3.6 FINISHING FORMED SURFACES

A. Provide smooth form finish at concrete wall surfaces exposed to public view. Provide smooth troweled finish on all top concrete surfaces.

3.7 INSERTS, EMBEDDED PARTS, AND OPENINGS

A. Provide formed openings where required for sill and head beams and other work to be embedded in and passing through concrete.
B. Coordinate work of other sections and cooperate with trades involved in forming and setting openings, slots, recesses, chases, sleeves, bolts, anchors, and other inserts.

3.8 CONCRETE PLACEMENT

A. Comply with ACI 304, placing concrete in a continuous operation within planned joints or sections. Do not begin placement until work of other trades affecting concrete is completed.

B. Consolidate placed concrete using mechanical vibrating equipment with minimal hand rodding and tamping, so that concrete is worked around reinforcement and other embedded items, and into all parts of forms.

C. Protect concrete from physical damage or reduced strength due to weather extremes during mixing placement and curing.

3.9 CURING

A. All concrete shall be cured in accordance with requirements of the ACI Standard 301.

B. Concrete flatwork shall be wet cured using burlap or other means for maintaining the concrete in a moist condition.

C. Temperature of Concrete During Curing:

1. When the atmospheric temperature is 40 degrees F. and below, maintain the concrete temperature between 50 and 70 degrees F. continuously throughout the curing period. When necessary, make arrangements before concrete placing for heating, covering, insulation, or housing as required to maintain the specified temperature and moisture conditions continuously for the concrete curing period. Provide cold weather protections complying with the requirements of ACI 306.

2. When the atmospheric temperature is 80 degrees F., and above, or during other climatic conditions which will cause too rapid drying of the concrete, make arrangements before the start of concrete placing for the installation of wind breaks or shading, and for fog spraying, wet sprinkling, or moisture retaining covering. Protect the concrete continuously for the concrete curing period. Provide hot weather protections complying with the requirements of ACI 305.

3. Maintain concrete temperature as uniformly as possible, and protect from rapid atmospheric temperature changes. Avoid
temperature changes in concrete which exceed 5 degrees F. in any one hour and 50 degrees F. in any 24-hour period.

3.10 PROTECTION

A. Protect exposed flatwork and cement finish with such protection as is necessary to prevent damage. Protect work of others from damage by the work of this section, and provide protection of exposed slabs. Maintain protection in effective condition as long as the need for protection exists.

3.11 MISCELLANEOUS CONCRETE ITEMS

A. Filling In:

1. Fill in holes and openings left in concrete structures for the passing of work of other trades, unless otherwise directed, after the work of other trades is in place. Mix, place, and cure concrete as herein specified, to blend with in-place construction. Provide all other miscellaneous concrete filling to complete the work.

3.12 REMEDIAL WORK

A. General:

1. Reinforce or replace deficient work as directed by the Engineer and at no additional cost to the Owner.

B. Patching:

1. Repair defective areas and fill form tie holes and similar defects in accordance with Chapter 9 of ACI 301. Where, in the opinion of the Architect, surface defects such as honeycomb occurs, repair the defective areas as directed by the Engineer.

3.13 ACCESSORIES

A. Non-Shrink Grout:

1. Mix non-shrink grout in strict accordance with Manufacturer's recommendations. Store and protect product in a manner that will not impair future use.

B. Epoxy Adhesive:

1. Use all epoxy adhesive products in accordance with Manufacturer's specifications.
END OF SECTION
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