

Spring Creek Prairie Audubon Center
Deferred Maintenance Infrastructure Improvements 2021



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SECTION 00 11 16
INVITATION TO BID

INVITATION NO.: 2021-1.01 Deferred Maintenance Projects 2021

1. INVITATION

1.01 National Audubon Society, Inc (Owner) invites Bids for the following project:

Project Name: Deferred Maintenance Project 2021

Center: Spring Creek Prairie Audubon Center

Address: 11700 SW 100th St
PO Box 117
Denton, NE 68339

Owner's Project Administrator: Meghan Sittler, Meghan.Sittler@audubon.org

Engineering Consultant: Settje Agri-Services and Engineering

Contract to be Awarded: Single Contract covering the work of all trades

2. TIME AND PLACE FOR RECEIPT OF BIDS

2.01 Bid Responses shall be submitted by email to Owner's Project Administrator

Closing Date and Time for Receipt of Bids: __Friday, April 30 at 5:30 pm

Opening Place of Emailed Bids: 11700 SW 100th St
Denton, NE 68339

3. BID SECURITY

3.01 Bid Security in the amount of 5% of the amount of the Base Bid is required.

4. BOND

4.01 Successful Bidder will be required to furnish an Owner's Protective Bond in the amount of 100% of the Contract Amount

4.02 An electronic copy of the bond must be submitted as an attachment with the bid.

5. BID DOCUMENTS

- 5.01 Bidding documents may be obtained directly from the owner via email or file sharing service. All other information or documents obtained from other avenues will not be reviewed and the bid will be considered invalid.

6. INFORMALITIES AND REJECTION OF BIDS

- 6.01 Owner reserves the right to waive any informality or irregularity, in any Bid, which does not materially affect the integrity or effectiveness of the competitive bidding process. Owner further reserves the right to reject any or all bids and to re-advertise for Bids.

7. LAST DAY FOR BIDDER QUESTIONS

- 7.01 The last day for bidders to submit questions is **5 calendar days prior to bid closing**. Questions shall be submitted to the Owner's Project Administrator.

END OF SECTION

SECTION 00 21 13
INSTRUCTIONS TO BIDDERS

1. DEFINITIONS

- 1.01 Bidding Documents include Invitation to Bidders; Instructions to Bidders, Bid Proposal Form (when applicable) and proposed Contract Documents, including any Addenda issued prior to receipt of Bids.

2. BIDDER'S REPRESENTATION

- 2.01 The Bidder, by making a Bid, represents that:
- A. The Bidder has read and understands Bidding Documents.
 - B. The Bidder is familiar with the site and has become familiar with local conditions under which the work is to be performed and with Federal, State and Local laws, ordinances, rules, and regulations affecting performance of the work, and correlated personal observations with requirements of proposed contract documents.
 - C. The Bid is based upon labor, materials, products, systems, equipment, and other items required by Bidding Documents without exception.
 - D. The Bidder is domesticated (or has obtained a Certificate of Authority to do Business in the State of Nebraska) in the State of Nebraska.

3. EXAMINATION OF BIDDING DOCUMENTS

- 3.01 Each Bidder shall examine Bidding Documents, examine site and local conditions, and shall make written request to the Owner for interpretation or correction by the Engineer of any ambiguity, error or inconsistency discovered. Requests must be submitted according to the directions on the Invitation to Bid.
- 3.02 Any instruction, change, interpretation, or correction shall be set forth by Addenda. No Bidder shall rely upon response made in any other manner.

4. ADDENDA

- 4.01 Addenda are written or graphic instruments issued by Owner prior to the Bid closing date, which modify or interpret Bidding Documents by additions, deletions, clarifications, or corrections. Addenda shall be binding and shall become part of the Contract Documents.
- 4.02 Addenda may be issued by the Owner prior to date and time for receipt of Bids. Email notifications will be distributed to all bidders.

- 4.03 Bidder is responsible for incorporating all published Addenda in their final bid submission. Failure to include such addenda shall not relieve Bidder from any obligation under the Bid as submitted.

5. BID SECURITY

- 5.01 Bid Security is required. Make payable to: National Audubon Society, in the amount of 5% of the Base Bid Amount.
- 5.02 Bid Security shall be one of: cashier's check, certified check, or Bid Bond issued by a Surety licensed to conduct business in the State of Nebraska. Form of Bid Bond is Included with these Documents. Any agent signing a bid bond on behalf of the Surety must attach a Power of Attorney effectively evidencing the agent's authority to bind the Surety to the performance of the Bid Bond.
- 5.03 Owner reserves right to retain Bid Security of three lowest Bidders until 45 days after receipt of Bid or until selected Bidder enters into Contract, whichever is shorter, and thereafter such Bid Security for the Bidders not selected will be returned to the appropriate Bidder upon Owner's receipt of a written request from such Bidder.
- 5.04 Bid Security of selected Bidder shall be retained until Owner receives executed Owner-Contractor Agreement, Owner's Protective Bond, and Certificates of Insurance.
- 5.05 If any Bidder refuses to enter into a Contract or fails to furnish required Bonds and Certificates of Insurance within 10 working days following notice of contract award, Bid Security shall be forfeited to Owner as liquidated damages but not as penalty.

6. OWNER'S PROTECTIVE BOND

- 6.01 The selected Bidder will be required to furnish an Owner's Protective Bond in the amount equal to 100% of the Contract Sum to cover contractual performance and as security for the payment of all obligations of the Contractor to all laborers and mechanics for labor, and for all materials and equipment used in the completion of the project.
- 6.02 The required bond shall be delivered to the Owner not less than 10 days following notice of contract award. If the work is to be commenced prior thereto in response to a notice to proceed, the selected Bidder shall, prior to commencement of the work, submit evidence satisfactory to the Owner that such bond will be furnished and delivered in accordance with this paragraph.
- 6.03 Bond shall be written on the form provided in these bidding documents, by a Surety licensed to conduct business in the State of Nebraska.
- 6.04 The bond shall be dated to coincide with the date of the Contract.

7. SUBSTITUTIONS

- 7.01 Where Bidding Documents refer to any items, materials, products and equipment by means of one or more manufacturer's trade name, catalog reference, or similar means of identification, such reference establishes standard of required quality, appearance, dimension, or function.
- 7.02 Requests for proposed substitution shall be made in writing to the Owner's Project Administrator
- A. Request shall be received by the last day to submit questions, as identified in the Invitation to Bid.
 - B. Bidder shall assume and bear all responsibility for coordinating and performing related changes in the Work necessitated by such substitution and has included such costs in the Bid.
 - C. Burden of proof of merit of proposed substitution is upon Bidder.
 - D. All approved substitutions shall be set forth in Addenda.

8. PREPARATION OF BIDS

- 8.01 Complete all blanks and provide all information requested on Bid Proposal Form. Failure to complete line items or include required attachments may be the basis for the rejection of bid.
- 8.02 Interlineations, alterations, and erasures of any attached documents must be initialed by the signer of the bid.

9. SUBMISSION OF BIDS

- 9.01 All Bids must be accompanied by Bid Security and any other required documents.
- 9.02 Bids sent by mail will not be accepted.
- 9.03 Unless otherwise provided, no Bidder shall modify, withdraw, or cancel the Bid or any part thereof for 60 calendar days after the time designated for receipt of Bids.

10. OPENING OF BIDS

- 10.01 Bids will be opened at the location indicated in the Invitation for Bids. Once the bid opportunity officially closes, all bid information will be gathered and the evaluation process will begin. Bid tabulations will be provided upon written request to the Owner.

11. BID PROTEST

- 11.01 Bid protests must be received no later than 7 calendar days after contract award notification is received.
- 11.02 Protests must be written and include, at a minimum, the following:

- A. the name and address of the protestor
 - B. project name
 - C. a statement of the reasons for the protest
 - D. any available exhibits, evidence, or documents supporting the protest
 - E. the remedy requested
- 11.03 Protests that do not strictly address the solicitation process, specifications, evaluation or award will not be considered. The Owner's Project Administrator reviews all bid protests. The decision of the Owner will be communicated in writing to the protestor and is final.

12. REJECTION OF BIDS

- 12.01 Bidder acknowledges right of Owner to reject any or all bids and to waive any informalities or irregularities which do not materially affect the integrity or effectiveness of the competitive bidding process.
- 12.02 Bidder recognizes right of Owner to reject a bid if Bidder has failed to:
- A. Submit the bid by the specified closing date and time.
 - B. Furnish the required Bid Security.
 - C. Submit data and forms required by Bidding Documents.

13. AWARD OF CONTRACT

- 13.01 Intent of Owner is to award Contract to the lowest responsible Bidder, taking into consideration the best interests of the Owner. In determining the lowest responsible Bidder, bids may be rejected and awards made upon consideration of the following factors:
- A. Ability, capacity and skill to comply with the specifications and perform the work required by the contract.
 - B. Character, integrity, reputation, judgment, experience and efficiency.
 - C. Ability to perform the Work within the time specified.
 - D. Previous and current compliance with laws relating to the Contract.
 - E. The price bid for the Work
 - F. The time to complete the work. Time is of the essence and will be a factor in the award of this Contract.
 - G. The quality of the Bidder's performance of previous contracts.
 - H. Such other information as may be secured having a bearing on the decision to award the contract.
- 13.02 Owner reserves right to:

- A. Waive informalities or irregularities, in all circumstances to analyze Bids in detail and to award contract which, in the good faith exercise of reasonable discretion of the Owner, believes it to be in its best interest.
 - B. Accept Alternates in any order or combination, unless otherwise specified.
 - C. To determine the low responsible Bidder on the basis of lump sum Bid and Alternates accepted.
- 13.03 If a Bidder offers or submits a voluntary alternate, it shall be received as information only and not used as a basis for determination of the low Bidder.

14. SUBMISSION OF POST-BID INFORMATION

- 14.01 Upon notification by Owner, apparent low responsible Bidder shall submit within five working days the following:
- A. A list of names of subcontractors proposed for principal portions of the Work.
 - 1. Prior to final determination of low responsible Bidder, Owner will notify apparent low Bidder in writing if Owner has reasonable and substantial objection to and refuses to accept any person or firm on the list. If Owner has objection, Bidder may either withdraw Bid or submit a substitute person or firm with an adjustment in cost to cover any differences. Owner shall accept adjusted Bid price or disqualify Bidder. In either condition, Bid Security shall not be forfeited.
 - 2. Staff names: Submit a list of the Contractor's principal staff assignments, including the Superintendent and other key personnel on site.
 - B. Copies of licenses or certifications required for the work if federal, state, or local law requires that portions of the work be done by licensed or certified personnel.

15. SALES AND USE TAX

- 15.01 Owner shall furnish Contractor with a Purchasing Agent Appointment and Exempt Sale Certificate Form for items incorporated into the Work considered by State of Nebraska to be exempt from Sales Tax. Contractor is responsible to monitor valid dates and notify Owner if an extension is necessary.
- 15.02 This Appointment and Exempt Sale Certificate does not apply to:
- A. Purchase of materials to be used but not incorporated into the Contract work, including but not limited to form lumber, scaffolding, etc.
 - B. Purchase or rental of machinery, equipment or tools owned or leased by Contractor and used in performing the work.

16. INSURANCE

- 16.01 The successful Bidder will be required to secure and maintain during the life of the Contract insurance of the types and with the required limits of liability set forth in the contract. The successful Bidder will be solely responsible for any and all costs,

losses, or damages due their failure to maintain the required insurance during the life of the contract.

17. PERMITS AND FEES

- 17.01 Contractor shall secure and pay for all permits and inspections required by law, e.g. Electrical, Storm-water, etc.

18. MODIFICATIONS OR WITHDRAWAL

- 18.01 Bidder may modify or withdraw its Bid at any time prior to the bid closing date and time.
- 18.02 Modifications to Bids after the bid deadline will not be permitted. No proposal may be withdrawn following the scheduled opening of proposals. Request for bid withdrawal shall include justification and be in writing and signed by the person or persons legally authorized to bind the Bidder to a contract.

19. OWNER'S DESIRED SCHEDULE

- 19.01** Time is of the essence and may be a factor in the award of this Contract. The Owner intends to finally complete and occupy the entire project not later than June 30, 2021.

END OF SECTION

SECTION 00 41 13

BID PROPOSAL

TO: National Audubon Society
 c/o Spring Creek Prairie Audubon Center
 Meghan Sittler
 11700 SW 100th St
 PO Box 117
 Denton, NE 68339

PROJECT: Deferred Maintenance Projects 2021

COMPLETE THE FOLLOWING INFORMATION – BIDDERS NAME AND TYPE OF BUSINESS:

This Bid is offered by _____, hereinafter referred to as the Bidder,

- a corporation organized and existing under the laws of the State of _____.
- a limited liability company organized and existing under the laws of the State of _____.
- a partnership doing business as _____.
- an individual doing business as _____.

In response to the Bidding Requirements for the construction of the project identified above, the Bidder hereby makes the following representations:

Bidder has received the drawings and specifications for the project prepared by **Settje Agri-Services and Engineering**.

Bidder has examined the Bidding Documents and familiarized itself with the site and local conditions affecting the construction of the project.

COMPLETE THE FOLLOWING INFORMATION – BASE BID WITH BREAKDOWN:

Bidder agrees to furnish all labor, materials, tools, equipment, services, transportation, and supervision required to complete the work indicated in the Bidding Documents within the time set forth herein for the lump sum Base Bid amount of

_____ dollars (\$_____).

<i>Base Bid Quantities</i>					
Item No.	Description	Unit	Quantity	Unit Price	Total
0.1	Mobilization & Demobilization	LS	1		
1.0	Driveway and Parking Lot				
1.1	Clearing and Grubbing	LS	1		
1.2	Seeding and Mulching	AC	1.5		
1.3	Earthwork Cut (In-situ)	CY	2,300		
1.4	12" Culvert – DW HDPE	LF	210		
1.5	12" Culvert – CMP with FES	LF	20		
1.6	Riprap - Type A	TON	10		

Item No.	Description	Unit	Quantity	Unit Price	Total
1.7	Crushed Rock Base Course	TON	208		
1.8	Crushed Rock Surfacing	TON	520		
2.0	East Drive, Ditch, Grade Control				
2.1	Clearing and Grubbing	LS	1		
2.2	Seeding and Mulching	AC	0.8		
2.3	Earthwork Cut (In-situ)	CY	620		
2.4	Crushed Rock Base Course	TON	170		
2.5	Crushed Rock Surfacing	TON	43		
2.6	Riprap - Type B/C	TN	148		
2.7	12" Perforated Riser	VF	4		
2.8	12" Culvert – DW HDPE	LF	130		
3.0	Grade Building Pad				
3.1	Clearing and Grubbing	LS	1		
3.2	Seeding and Mulching	AC	0.3		
3.3	Site Grading	LS	1		
3.4	Earthwork Cut (In-situ)	CY	70		
4.0	Equipment Crossing				
4.1	FlexaMat with ECB	SF	500		
4.2	Seeding	SF	400		
5.0	Boardwalk				
5.1	Demo old boardwalk	LS	1		
5.2	Materials for new boardwalk and posts	LS	1		
TOTAL BASE BID					

PROVIDE THE FOLLOWING INFORMATION – BID SECURITY:

Included with this Proposal is Bid Security of the type and in the amount required by the Bidding Instructions.

COMPLETE THE FOLLOWING INFORMATION – NUMBER OF ADDENDA RECEIVED:

Bidder has received Addenda Nos. _____, and has included their provisions in this Bid.

COMPLETE THE FOLLOWING INFORMATION – CALENDAR DAYS TO COMPLETE THE WORK:

To substantially complete the work not later than _____ calendar days from the start of construction given in the Notice to Proceed. (Bidder to enter number of days.) Time is of the essence and may be a factor in the award of this Contract.

COMPLY WITH THE FOLLOWING INFORMATION:

In submitting this Bid, Bidder agrees to the following:

1. To hold this Bid open for 60 days following the bid date.

- 2. To enter into and execute the "Independent Contractor Agreement" based upon this Bid, if accepted by Owner.
- 3. To perform all work required by the Contract Documents.
- 4. That this Bid has been arrived at without collusion with other Bidders and without any effort or activity which might prevent the Owner from receiving the lowest possible competitive Bid.
- 5. To comply with Nebraska Fair Employment Practice Act, understanding that a breach of this provision will be regarded as a material breach of contract.

COMPLETE THE FOLLOWING INFORMATION – SIGNATURE AND CONTACT INFORMATION:

Address:

Signature:

Printed Name:

Tele. No.:

Title:

Fax. No.:

Dated this

day of

, 20

Email

Address:

**00 43 13
BID SECURITY FORM**

KNOW ALL MEN BY THESE PRESENTS:

That _____ (Bidder), as principal,
and _____ (Bonding company), as surety, a
corporation of _____, _____ whose principal office
is located at _____ are firmly bound unto
National Audubon Society (Owner), as obligee, to fulfill the obligations of the principal and the surety
under the contract to which reference is hereafter made, in the amount of:

_____ Dollars (\$ _____)

for payment whereof principal and surety bind themselves, their heirs, executors, administrators,
successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, principal has by written proposal, dated _____, offered to
enter into a contract with obligee for **Deferred Maintenance Projects 2021**, pursuant to the terms
and conditions set forth in the contract documents dated **March 31, 2021** including all addenda
thereto, the architect/engineering provisions which were prepared by **Settje Agri-Services and
Engineering** which proposal and contract documents are by this reference made a part of.

NOW, THEREFORE, the condition of this obligation is such that if the principal within ten (10)
days, or such additional time allowed by the obligee, after delivery by obligee to principal of notice of
acceptance of proposal for one or more of said bid schedule(s) shall furnish performance and
payment bond, insurance certificate or insurance policies, lump sum bid break down and execute
the contract all as specified in said contract documents, then this obligation shall be null and void;
otherwise it shall remain in full force and effect.

Any suit under this bond shall be instituted before the expiration of two (2) years from the
date for opening proposals.

Signed and sealed this _____ day of _____, 20____.

(Surety)

(Principal)

(Title)

(Title)

INDEPENDENT CONTRACTOR AGREEMENT

THIS AGREEMENT is hereby made between National Audubon Society, Inc. ("AUDUBON") and _____ ("IC") according to the following terms and conditions:

1. CLIENT:

AUDUBON is identified as follows:

Name: National Audubon Society, Inc.
Address: 225 Varick Street, 7th Floor
New York, NY 10014

Business Telephone: (212) 979-3000

-and-

Audubon Office
Contracting for Services: Spring Creek Prairie Audubon Center

Address: 11700 SW 100th St
PO Box 117
Denton, NE 68339

Project Manager's Name: Meghan Sittler
Business Telephone: 402-797-2301
Email: meghan.sittler@audubon.org

2. INDEPENDENT CONTRACTOR:

The Independent Contractor ("IC") is identified as follows:

Name:

Type of Entity: () Sole Proprietorship
() Partnership () Corporation
() Individual
() Other _____

Address:

Contact:
Business Telephone:
Email:
License Number and Expiration Date:

3. WORK TO BE PERFORMED:

IC shall perform the following services for AUDUBON (add attachment if necessary):
Construction Services—deferred maintenance projects.
Please see attached Construction Documents

IC shall furnish all labor, materials, services and equipment ("work") required for AUDUBON's boardwalk, driveway, parking lot and stormwater management deferred maintenance projects. per Exhibit A attached in accordance with the terms of this Agreement.

4. PAYMENT AMOUNT AND TERMS: AUDUBON shall pay IC according to the following terms and conditions:

The total amount payable by AUDUBON to IC for the performance of the work will not exceed \$ _____ (as may be revised by approved Change Orders, the "Contract Sum"). IC will submit monthly invoices to AUDUBON for work completed and satisfactory to AUDUBON. Payment shall be made on the basis of costs incurred to date, less retention in the amount of 10% of the invoice amount. Each monthly invoice will specifically describe work completed to date, including the type and amount of work or services supplied along with detailed backup for the labor, materials and profit and the amounts, if any, owed to each of its subcontractors and will be accompanied by partial waivers of lien signed by IC and by each of its subcontractors (and sub-subcontractors) for the full amounts paid by AUDUBON through the previous payment, including reductions in retention. Payment of the 10% retention shall be made upon IC's satisfactory completion of the work. AUDUBON will make payments against approved invoices within 30 calendar days after receipt by AUDUBON. Upon the making of partial payments by AUDUBON, all work, materials and equipment covered thereby shall become the sole property of AUDUBON; however, partial payments shall not constitute acceptance of IC's work by AUDUBON, nor be construed as a waiver of any right or claim by AUDUBON.

AUDUBON may withhold payments otherwise due IC as necessary to protect AUDUBON against loss because of: (a) IC's failure to take prompt and adequate action to bring the work on schedule or to correct deficiencies in the work or to perform any obligations hereunder; (b) claims by other parties filed in connection with the work, or reasonable evidence indicating probable filing of such claims, or mechanics' or materialmen's liens filed against AUDUBON's real property or (c) damage to others caused by IC, or its subcontractors or suppliers, for which AUDUBON may be held liable.

Upon receipt of written notice from IC that the work has been satisfactorily completed in accordance with this Agreement, that final payment should be made and that the work is ready for final inspection and acceptance, AUDUBON will promptly make an inspection. AUDUBON will make final payment to IC within 30 calendar days after: AUDUBON's acceptance of the completed work, receipt of IC's final invoice, accompanied by: any guaranties or warranties, if applicable, an affidavit of IC that all Federal, State and Local taxes applicable to the work have been paid, release of record of all liens which affect the real property upon which the work was performed, and general releases and waivers of lien, signed by IC and each of its subcontractors and sub-subcontractors.. The acceptance of final payment shall constitute a waiver of all claims by the IC.

AUDUBON is exempt from Federal Excise Taxes and is also exempt from state and local sales or use taxes in the following states: Arkansas, Arizona, Colorado, Connecticut, Florida, Illinois, Indiana, Kentucky, Maryland, Massachusetts, Michigan, Minnesota, Missouri, Nebraska, New Jersey, New Mexico, New York, North Carolina, North Dakota, Ohio, Pennsylvania, Tennessee, Texas, Utah, Vermont, Virginia, Washington, Washington DC, Wisconsin and Wyoming. IC agrees that it has not included such taxes in the payments to be made by AUDUBON.

5. WORK SCHEDULE: (a) IC shall commence the work within ___ days from the date of this Agreement and shall complete the work within ___ days of the date of commencement. All time limits stated in this Agreement, whether set forth above or elsewhere herein, are of the essence.

(b) If the work is not on schedule for any reason within the control or responsibility of IC, the remedial actions of IC shall include increasing manpower or working such overtime as is required to bring the work

back within schedule at no additional cost to AUDUBON. If the work is not on schedule because of delays which are not the fault of nor under the control of IC, and which a reasonably prudent experienced contractor would not have foreseen (including acts of god, labor disputes and government restrictions), the remedial actions shall be presented to AUDUBON to choosing between accepting the excusable delay or increasing the amount payable to IC hereunder to pay for remedial action.

6. **REIMBURSEMENT OF EXPENSES:** AUDUBON shall not be liable to IC for any expenses paid or incurred by IC unless otherwise agreed in writing and, in any case, AUDUBON will not reimburse IC for any expenses unless IC submits complete documentation therefor within thirty (30) days of termination of this Agreement.
7. **INDEPENDENT CONTRACTOR:** IC will perform services hereunder as an independent contractor and not as an AUDUBON employee. IC shall supply, at IC's sole expense, all equipment, tools, materials and/or supplies necessary to accomplish the work. IC shall be responsible for the payment of United States FICA, FUTA, other self-employment taxes and all federal, state, local and, if applicable, foreign income taxes with respect to the compensation paid to IC by AUDUBON and shall indemnify and hold harmless AUDUBON against claims made in respect thereto. IC acknowledges and agrees that IC shall not be entitled to receive from AUDUBON any statutory or fringe benefits of any kind, including without being limited to those extended by AUDUBON to its own employees. IC is not eligible to claim or collect unemployment insurance benefits based on work performed as an independent contractor for AUDUBON. No workers' compensation insurance shall be obtained by AUDUBON concerning IC or the employees of IC. IC shall comply with the workers' compensation law concerning IC and IC's employees. IC acknowledges that IC's workers' compensation coverage is IC's sole remedy for any injury incurred performing work for AUDUBON, including work performed on AUDUBON's premises. IC hereby knowingly and voluntarily waives any right to claim any coverage and/or benefits under AUDUBON's insurance coverages. IC declares that IC has complied with all federal, state, and local laws regarding business permits and licenses that may be required to carry out the work to be performed under this Agreement. IC agrees that even if a court or government agency determines that IC and AUDUBON have had a common law employer-employee relationship, IC will still be bound by this Agreement and will not be entitled to receive from AUDUBON or have AUDUBON provide on IC's behalf any different or additional pay, or any benefits, insurance coverage, tax payments, or withholding, or compensation of any kind. IC hereby knowingly and voluntarily waives any right to claim any such benefits or payments on the basis of the performance of services under this Agreement.
8. **NO AUTHORITY TO BIND AUDUBON:** IC has no authority to enter contracts or agreements on behalf of AUDUBON. This Agreement does not create a partnership, joint venture or agency relationship between the parties hereto.
9. **RESPONSIBILITIES OF IC:** IC is responsible for performing, managing, supervising, directing and coordinating the work. IC shall be responsible for any work or materials which are defective or improperly performed or for construction errors or defects, or for failure to comply with this Agreement. Costs incurred in connection therewith or in correcting same including time lost correcting such work shall be the responsibility of IC. IC shall give all notices and comply with all laws, ordinances, rules, regulations and orders of any public authority or public utility bearing on the performance of the work. IC shall confine any equipment, apparatus, materials and operations within limits designated or allowed by AUDUBON and shall not unreasonably encumber the job site with materials. IC shall keep the job site clear and clean during construction, including the proper removal of all waste materials, rubbish, tools, scaffolding and surplus materials and equipment from the job site and leave the site broom clean upon completion of construction.
10. **NO USE OF NAME:** IC shall not use the name of AUDUBON or the name of any employee in any manner for any purpose whatsoever to imply that AUDUBON endorses or supports IC (including publicly naming AUDUBON as a client), without AUDUBON's prior written consent.
11. **REPRESENTATIONS AND WARRANTIES:** IC represents and warrants that (i) it has inspected the site, has familiarized itself with local conditions under which the work is to be performed, has compared its observations with the requirements of this Agreement and has made all other investigations essential to a full understanding of the work and the difficulties which may be encountered in performing the work; (ii) all materials and equipment incorporated in the work shall be new, owned by IC outright, free of all liens and

encumbrances and that all work shall be of good quality, free from faults and defects and in conformance with this Agreement; all work not conforming to these standards will be considered defective; (iii) IC is financially responsible and experienced in and competent to perform the type of work required hereunder, shall comply with all applicable laws, ordinances and regulations governing the work required hereunder; and (iv) IC has the full power and authority to enter into and perform this Agreement and to grant the rights granted hereunder.

12. **REVIEW AND APPROVAL; CHANGE ORDERS:** AUDUBON shall review all work performed under this Agreement and shall have final approval of all decisions relating to changes in the work. IC will submit to AUDUBON an itemized Lump Sum proposal for any change to the work by its subcontractors and/or IC's own forces by which the Contract Sum may be increased or decreased. The proposal shall include detailed breakdown(s) of labor, material and equipment for all items of work involved, and the effect, if any, on the scheduled work items affected by reason of such work. Upon agreement on a price for any change, IC will be authorized to proceed with the work. The Contract Sum will be formally amended by a Change Order. Change Orders will be issued monthly or more frequently as required, consolidating all prior Change Orders and will revise the current Contract Sum and schedule, as applicable.
13. **EMPLOYEE PERFORMANCE:** IC shall be responsible to AUDUBON for all acts and omissions of its agents and employees and all persons performing any of the work. If AUDUBON reasonably objects to the manner of performance of any employee of IC, IC shall immediately take all necessary actions to rectify the objections, including if necessary, the prompt removal of the employee from the provision of services to AUDUBON.
14. **CONFIDENTIALITY:** IC shall treat as confidential all data, records and accounts, information, operations, policies, procedures, personnel, marketing plans or prospects and all other information, which becomes known to it through its activities hereunder and which is not otherwise in the public domain or rightfully obtained from another source. During the term and after termination its services to AUDUBON, IC shall not use or disclose any such protected information, except in accordance with the terms of this agreement or as required by law, regulation or court order. All records, reports, notices, valuations, lists, data and other documents prepared by IC shall be the property of AUDUBON and IC shall deliver any such documents to AUDUBON upon request by AUDUBON. IC shall obtain from all sources, third parties or subcontractors utilized by it in producing its product hereunder a signed written statement agreeing to the provisions of this Article.
15. **FINANCIAL RECORDS:** AUDUBON shall have the right to audit all financial records of IC pertaining to AUDUBON, this Agreement and the work. All financial records must be maintained separately from all other accounts.
16. **SUFFICIENT USE OF PRECAUTION:** In connection with the work provided pursuant to this Agreement, IC hereby covenants and agrees to take, use, provide and make proper, necessary, and sufficient precautions, safeguards, and protection against the occurrence or happening of any accidents, injuries (including death), damages, or hurt to any person or property during progress thereof.
17. **INDEMNIFICATION:** IC shall indemnify, defend and hold harmless AUDUBON, its officers, directors, members, employees and agents from and against any and all claims, demands, causes of action, damages, judgements, losses, liabilities, costs and expenses (including reasonable attorney's fees incurred by AUDUBON in defense of a third party action or to enforce the provisions of this paragraph against IC) arising or resulting, whether directly or indirectly, from any action or failure to act on the part of IC or breach by IC of any of its obligations, representations and warranties under this Agreement; provided, however, that in no event shall IC be liable for incidental or special damages.
18. **INSURANCE:** IC shall procure and maintain the following insurance with the following coverages and minimum limits until three months after completion of the work by the IC:
 - (a) Certificates of Insurance. IC shall pay for and deliver to AUDUBON within 10 days after this Agreement is executed, and before commencing the work, certificates of insurance. Said certificates of insurance, on standard forms issued by IC's insurers or authorized

representatives of IC's insurers, shall be sufficient to evidence coverage. IC's failure to deliver said certificates shall not relieve IC of any liability in connection with the obligations of this Article. In addition, Audubon may cancel the Agreement on 10 days notice, and Audubon shall be relieved of all liability to IC regardless of any work performed or materials furnished unless, within such 10-day period, IC delivers said certificates of insurance to Audubon.

- (b) Coverage. IC shall provide and maintain in full force, the following insurance coverages, unless otherwise noted, in not less than the following amounts:
- (i) Workers Compensation and Employers Liability Insurance, including occupational disease, disability benefit, and other similar insurance required by applicable law, with a minimum limit of \$100,000 per accident, per employee;
 - (ii) Comprehensive General Liability Insurance with a combined single limit of \$1,000,000 per occurrence, and \$2,000,000 general aggregate for bodily injury, including death, product liability and property damage;
 - (iii) Comprehensive Automobile Liability Insurance (owned, non-owned, and Hired) with a combined single limit of \$1,000,000 for bodily injury, including death, and property damage; and
 - (iv) Excess Liability (Umbrella) Insurance with limits of \$3,000,000 per occurrence and aggregate.
- (c) AUDUBON Named As Additional Insured. Comprehensive General Liability Insurance, Comprehensive Automobile Liability Insurance, and any Excess Liability policies shall be endorsed to name National Audubon Society, Inc. as an additional insured and shall be written to cover claims incurred, discovered, manifested or made during or after expiration of the contract. The insurance required pursuant to this Article shall be primary coverage; any insurance AUDUBON may purchase shall be excess and noncontributory.
- (d) Full Coverage Availability. IC represents and warrants that no claims have been made to date under the insurance policies evidenced by the certificates of insurance. IC shall notify AUDUBON immediately of any claims made under its insurance policies evidenced by the certificates of insurance.
- (e) Policy Expiration. In the event that the insurance policies evidenced by the certificates of insurance will expire during the term of this Agreement, IC shall deliver to AUDUBON, at least 30 days before said insurance policies expire, new certificates of insurance that conform with and are subject to the requirements, representations, and warranties of this paragraph.
- (f) Subcontractors. IC shall require all subcontractors, unless otherwise approved by AUDUBON, to also carry insurance equal in kind and amount to that required by this Paragraph.

19. **TERMINATION WITHOUT CAUSE:** Without cause, AUDUBON may terminate this Agreement upon 7 days written notice to IC of its intent to terminate without cause. The parties shall deal with each other in good faith during the 7-day period after any such notice of intent to terminate without cause has been given. IC shall be paid for all work performed in a satisfactory manner to the date of termination.
20. **TERMINATION WITH CAUSE:** If IC is adjudged bankrupt, or makes a general assignment for the benefit of its creditors, or a receiver is appointed on account of its insolvency, or if it should persistently or repeatedly refuse or should fail to supply enough properly skilled workers or proper materials, or if it should fail to make prompt payment to subcontractors for material or labor, or be in breach of any provision of this Agreement, AUDUBON may, without prejudice to any other right or remedy and after giving IC seven (7) calendar days' written notice, terminate this Agreement or any part of the work, and take possession of the work and of all materials and tools, and finish the work by whatever method it may deem expedient. In the event of the termination of this Agreement under this section, IC shall not be entitled to receive any further payment except as

may be provided in this section. Upon completion of the work by others, AUDUBON shall pay to IC upon submission of applicable documentation in accordance with Section 4 hereof, the net sum due IC for unpaid costs incurred by IC for work completed subsequent to the date of IC's previous invoice, and IC's cost of terminating subcontracts. If this Agreement is terminated as to part of the work covered by a subcontract, upon completion of the work by others, AUDUBON shall pay IC the net sum due for work completed by the subcontractor subsequent to the subcontractor's previous invoice to IC, and the subcontractor's costs of terminating its subcontracts. However, AUDUBON shall not be obligated to pay IC any amount for the foregoing which when added to the costs AUDUBON incurs to complete the work plus all sums paid to IC, would exceed the Contract Sum. If the cost AUDUBON incurs to complete the work exceeds the Contract Sum, IC shall be liable to AUDUBON for such additional sum to compensate AUDUBON for the damages and losses sustained by AUDUBON as a consequence of the termination.

21. **NOTICES:** Any notice given in connection with this Agreement shall be given in writing and shall be delivered either by hand to the party or by certified mail, return receipt requested, to the party at the party's address stated herein. Any party may change its address stated herein by giving notice of the change in accordance with this paragraph.
22. **NON-WAIVER:** The failure of either party to exercise any of its rights under this Agreement for a breach thereof shall not be deemed to be a waiver of such rights or a waiver of any subsequent breach.
23. **ENTIRE AGREEMENT:** This is the entire agreement of the parties with respect to the subject matter hereof and supersedes all prior agreements.
24. **AMENDMENTS:** This Agreement may be supplemented, amended or revised only in a manually signed document by agreement of the parties.
25. **SEVERABILITY:** If any part of this Agreement shall be held unenforceable, the rest of this Agreement will nevertheless remain in full force and effect.
26. **NO ASSIGNMENT:** IC acknowledges that the services to be performed by IC for AUDUBON are of a personal nature, and IC agrees not to assign this Agreement, in whole or in part, to any other person or entity without the prior written consent of AUDUBON.
27. **CHOICE OF LAW; JURISDICTION:** This Agreement is entered into in the State of New York and shall be construed in accordance with the internal substantive laws of New York applicable to contracts to be wholly performed therein. The parties agree that any action, suit or proceeding based upon any matter, claim or controversy arising hereunder or relating hereto shall be brought solely in the State Courts of or the Federal court in the State and County of New York; except that in the event either party is sued by a third party or joined in any other Court or in any forum by a third party in respect of any matter which may give rise to a claim hereunder, the parties consent to the jurisdiction of such court or forum over any claim which may be asserted therein between the parties thereto. The parties hereto irrevocably waive any objection to the venue of the above-mentioned courts, including any claim that such action, suit or proceeding has been brought in an inconvenient forum.
28. **GUARANTEES:** IC guarantees to perform the work in a first class, workmanlike manner and guarantees all work against defects in material or workmanship for a period of one year from the date of acceptance of the work and final payment by AUDUBON. Within a reasonable time after receipt of written notice thereof, IC shall correct any defects in material or workmanship which exist prior to and during the period of the guarantee provided herein and any damage to other work or property caused by such defects or the repairing of such defects. The guarantee provided herein shall not be construed to modify or limit any rights or actions that AUDUBON may otherwise have against IC by law or statute, or in equity, for breach of contract or improper performance of defective work.
29. **COMPLIANCE WITH FEDERAL LAW:** In compliance with the law as provided in the USA Patriot Act (Pub. L. No. 107-56) and the Foreign Corrupt Practices Act (Pub. L. No. 95-213), IC certifies that IC and IC's key employees 1) have not provided, and will take all reasonable steps to ensure that they do not and will not

knowingly provide, material support or resources to any individual or entity that commits, attempts to commit, advocates, facilitates, or participates in terrorist acts; 2) do not appear on lists of Specially Designated Nationals and Blocked Persons maintained by the U.S. Treasury's Office of Foreign Assets Control (available online at www.treasury.gov/ofac/downloads/t11sdn.pdf) or of individuals or entities designated by the United Nations Security Council Sanctions Committee as associated with any terrorist organization; and 3) have not and will not make, give, promise, or offer any payment, directly or indirectly, to any foreign government employee or official (a) in contravention of any U.S. or other applicable law or regulation and (b) without the express consent of the government for which the employee or official works, if the payment is intended to influence any official government act or decision, to induce any government employee or official to do or omit to do any act in violation of his or her lawful duty, or to obtain or retain business for, or direct business to any individual or entity.

- 30. JOINT AND SEVERAL LIABILITY:** If two or more persons sign this Agreement as ICs, each such person shall be jointly and severally liable for the performance of all the terms and conditions of this Agreement.

The parties hereto have executed this Agreement as of the latest date shown below.

NATIONAL AUDUBON SOCIETY, INC.

Vice President

Date: _____

Chief Financial Officer

Date: _____

INDEPENDENT CONTRACTOR:

Name of IC

By: _____

Title: _____

Date: _____

00 61 13
PERFORMANCE AND PAYMENT BOND

KNOW ALL MEN BY THESE PRESENTS:

That _____ (Contractor), as principal,
and _____ (Bonding company), as surety, a
corporation of _____, _____ whose principal office
is located at _____ are firmly bound unto
National Audubon Society (Owner), as obligee, to fulfill the obligations of the principal and the surety
under the contract to which reference is hereafter made, in the amount of:

_____ Dollars (\$ _____)

for payment whereof principal and surety bind themselves, their heirs, executors, administrators,
successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, principal has by written proposal, dated _____, offered to enter into a
contract with obligee for **Deferred Maintenance Projects 2021**, pursuant to the terms and
conditions set forth in the contract documents dated **March 31, 2021**, the architect/engineering
provisions which were prepared by **Settje Agri-Services and Engineering** which contract
documents, including all modifications to the contract that may hereafter be made, notice of said
modifications to the surety being hereby waived is by this reference made a part hereof and which
is hereinafter referred to as the contract.

NOW, THEREFORE, the condition of this obligation is such that if the principal shall faithfully
perform all provisions of the contract on its part, and maintain the obligee and the obligee's property
free and clear of all liens arising out of agreements for labor and material and pay all laborers,
mechanics, and subcontractors and materialmen, and all persons who shall supply such person or
persons or subcontractors or materialmen with provisions and supplies for the carrying on of such
work, and indemnify, defend and save harmless the obligee from all loss, cost or damage which it
may suffer by reason of the failure to do any of the foregoing, then this obligation shall be null and
void; otherwise it shall remain in full force and effect.

All persons who furnished labor, materials or supplies for use in and about the work provided
for in the contract shall have a direct right of action under this bond, subject to the obligee's priority.

Any suit under this bond shall be instituted before the expiration of two (2) years from the
date on which final payment under the contract is due.

Signed and sealed this _____ day of _____, 20____.

(Surety) (Principal)

(Title) (Title)

SECTION 01 10 00 – SPECIAL PROVISIONS**PART 1 - GENERAL****1.1. INTENT**

- A. These Special Provisions amend or supplement the following Specifications and other provisions of the Contract Documents as indicated below. All provisions which are not so amended or supplemented remain in full force and effect.
- B. The terms used in these Special Provisions will have the meanings indicated in the Specifications and Contract Documents. Additional terms used in these Special Provisions have the meanings indicated below, which are applicable to both the singular and plural thereof.

1.2. PROJECT CONTACT

- A. Owner's Primary Contact
 - 1. Name: Meghan Sittler
 - 2. Address: 11700 SW 100 St
PO Box 117
Denton, NE 68339
 - 3. Phone Number: 402.797.2301
 - 4. Email: meghan.sittler@audubon.org
- B. Engineer's Primary Contact
 - 1. Name: Travis Hazard
 - 2. Address: 15460 NW 48th St
Raymond, NE 68428
 - 3. Phone Number: 402.783.2100
 - 4. Cell Number: 402.525.3651
 - 5. Email: thazard@settje.com
- C. Engineer's Secondary Contact
 - 1. Name: David Robbins
 - 2. Address: 15460 NW 48th St
Raymond, NE 68428
 - 3. Phone Number: 402.783.2100
 - 4. Cell Number: 720.514.0280
 - 5. Email: drobbins@settje.com

1.3. BID FORM

- A. The bidders must provide bids using the supplied 00 41 13 Bid Proposal Form.

1.4. PRE-BID MEETING

- A. No Pre-Bid Meeting will be held. Prospective bidders are encouraged to visit the site and review the project details prior to submitting a bid to fully understand the inclusiveness of the project elements. Any questions shall be directed to the owner.

1.5. CONTRACT DESCRIPTION

- A. One Contract for construction of the base bid or any groups, and such alternates as Owner may select, based on what Owner believes to be in the best interest of Owner and the funds available for the work.

1.6. CONTRACT DRAWINGS AND SPECIFICATIONS

- A. The Drawings, Specifications, Proposal, Special Provisions and all supplementary documents are intended to describe the complete work and are essential parts of the Contract. All requirements occurring in any of them are binding.
- B. Specification sections have not been divided into groups for work of subcontractors or various trades. Should there be questions concerning the applicability or interpretation of a particular section or part of a section or drawing, direct questions to the Engineer.
- C. Piping work shown on the Drawings is intended to be representative and may not be an exact and complete representation of the actual finished work. Include fittings, joints, supports, nuts, bolts, and other accessories required to provide complete and satisfactory piping systems, as specified, even though some items may not be specifically shown on the Drawings.
- D. A part of the work that is necessary or required to make each installation satisfactory and operable for its intended purpose, even though it is not specifically included in the Specifications or on the Drawings, shall be performed as incidental work as if it were described in the Specifications and shown on the Drawings.
- E. In cases where there is a discrepancy in the contract documents:
 - 1. Written dimensions take precedence over scaled dimensions on Drawings.
 - 2. Larger scale Drawings take precedence over smaller scale Drawings.
 - 3. Section 01 10 00, Special Provisions, take precedence over the Drawings.
 - 4. Section 01 10 00, Special Provisions, take precedence over other Specification Sections.
- F. Referenced Sections:
 - 1. Any Specification Section that is referenced by another Specification Section and is not included in the project specifications (see table of contents for complete listing) shall not apply to this project.

- G. At least one copy of all Drawings and Specifications shall be maintained by Contractor at the project site and these shall be accessible at all times to Owner and Engineer.

1.7. EROSION CONTROL

- A. Contractor shall be responsible for maintaining and controlling all erosion control devices throughout the duration of the project as outlined in the SWPPP. The SWPPP field book will be supplied to contractor for documentation and management during construction.
- B. Contractor shall conduct weekly reviews of the erosion control measures and make any repairs or adjustments necessary.
- C. Copies of all reports, daily reports and forms recorded by Contractor shall be maintained on the site. A copy of these documents shall be provided to Owner through Engineer on a monthly basis. Pay requests will not be processed by Owner without copies of these documents.
- D. Contractor shall be responsible for removal and disposal of all temporary erosion control measures from the site after final stabilization measures are in place and satisfactory vegetation has been established.

1.8. CODE COMPLIANCE

- A. All proposed work shall comply with the National Plumbing Code, National Electrical Code, International Building Code and all applicable state and local codes.

1.9. SPECIAL FUNDING

- A. There is no special funding for this project.

1.10. INCIDENTAL AND SUBSIDIARY ITEMS OF WORK

- A. Any items or materials called for on the Drawings or in these Specifications that are not measured and paid for directly shall be considered incidental and subsidiary to other items of work for which direct payment is made.

1.11. PROJECT CONDITIONS

- A. Existing Utilities:
 - 1. There are utilities in the vicinity of the proposed work. Care shall be taken to fully understand the proximity to construction activities and follow the proper procedures to accurately locate, protect, or repair any damages that result from construction activities.
 - 2. Contractor shall notify the respective utility company(s) and/or "one-call notification center" before commencing work.
 - 3. Neither Owner nor Engineer assumes any responsibility for utility locations being accurately shown, or not shown on the Drawings.

4. Any reference to utilities in the Drawings is approximate. Contractor shall verify the location of any existing utilities within the vicinity of the proposed work.
5. Contractor shall provide notification of intent to begin construction in advance to allow utility company(s) sufficient time to locate or relocate their utilities.
6. Once the location of the utility(s) has been staked, located or marked, it shall be Contractor's responsibility to protect these stakes/markings. Any costs for restaking or remarking shall be Contractor's expense.
7. Contractor shall avoid damaging any utility(s). Any such damage caused by Contractor, Contractor's employees, subcontractors, suppliers or agents will be the responsibility of Contractor to repair at Contractor's expense. No additional compensation will be allowed for protecting utility(s) or for repair of any damage caused by Contractor, Contractor's employees, subcontractors, suppliers or agents.
8. Contractor shall coordinate utility relocation or reconstruction with the appropriate utility company.

1.12. REQUESTS FOR SUBSTITUTION

- A. Contractor shall obtain written approval from engineer prior to ordering for any items that are considered substituted materials for items called out on the plans. It is encouraged to seek more affordable and sustainable solutions by considering new or alternative products.
- B. Engineer will provide feedback on the acceptance of a substitute material within 48 hours of receipt of request.
- C. All submittals shall be submitted to the Engineer in digital pdf format.
- D. Engineer will review and issue approvals digitally.

1.13. SPECIAL EVENTS

- A. Visitors to the Center will require parking and drive access for normal use. Special events are scheduled which do not directly impact the work sites but may result in greater visitor traffic. The contractor is advised to keep apprised of upcoming events on the Center's event calendar: <https://springcreek.audubon.org/events>

1.14. RIGHT-OF-WAY/EASEMENTS

- A. The project shall be constructed within limited easements, right-of-way and property owned by Owner, as shown on the Drawings.
- B. Contractor shall confine all operations to areas within the limited easements, right-of-way and property owned by Owner, as shown on the Drawings.
- C. Areas outside of the limited easements, right-of-way and existing property owned by Owner, as shown on the Drawings, are not to be disturbed.
- D. Contractor shall exercise all reasonable care in any activities that are conducted in the areas of right of way and easement, to minimize damages to the property.

Contractor's attention is specifically called to any buildings, trees, fences, drainage structures and other miscellaneous appurtenances to the property.

- E. Contractor shall be solely and completely responsible for any damages caused by Contractor, Contractor's employees, sub-Contractors, suppliers or agents to any areas outside of the limited easements, right-of-way and existing property owned by Owner, as shown on the Drawings.
- F. Contractor shall be solely responsible for obtaining and shall pay all costs in connection with any additional work area, storage site, access to the site, or temporary right-of-way, which may be required for proper completion of the work.
- G. Staging Area: Contractor may stage equipment and materials at the location of the Phase II Maintenance Building.

1.15. SITE ADMINISTRATION

- A. Contractor shall be responsible for all areas of the site used by him and by all Sub-Contractors in the performance of the work. He will exert full control over the actions of all employees and other persons with respect to the use and preservation of the property and existing facilities, except such controls as may be specifically reserved to Owner or others. Contractor has the right to exclude from the site all persons who have no purpose related to the work or its inspection and may require all persons on the site (except Owner's employees and visitors to the Center) to observe the same regulations as he requires of his employees.
- B. Contractor may use the area within the limited easements, right-of-way and property owned by Owner, as shown on the Drawings, for storage and staging, but must not interfere with normal operations of Owner, without prior written approval from Owner.
- C. Other construction contracts may be under way at the same site, which may or may not be under separate funding. The Contractor shall make every effort to cooperate with the contractors of the other projects so that a minimum of interference and conflict is sustained.

1.16. OWNER OCCUPANCY

- A. The Owner will continuously occupy the project site.
- B. The Contractor will cooperate with the Owner to minimize conflict, and to facilitate the Owner's operations.
- C. Schedule the Work to accommodate the Owner's occupancy and use.
- D. Emergency Access: Maintain emergency vehicle access while the site is occupied during the construction process.

1.17. PROTECTION AND COOPERATION

- A. The Contractor shall provide all necessary barricades and protective devices for the protection of all new construction, materials, and the public during construction.

- B. The Contractor shall cooperate fully with the local utility companies and all government entities to ensure coordination of efforts.

1.18. POWER

- A. All power for lighting, construction use, operation of Contractor's plant or equipment, or for any other use by Contractor, shall be provided by Contractor at his sole cost and expense and shall be considered incidental and subsidiary to other items of work for which direct payment is made. No separate payments will be made for this work.

1.19. TEMPORARY FACILITIES

- A. Temporary Fencing will not be required.
- B. Temporary facilities shall be considered incidental and subsidiary to other items of work for which direct payment is made. No separate payments will be made for this work.

1.20. HISTORICAL AND ARCHAEOLOGICAL:

- A. If, during the course of construction, evidence of deposits of historical or archaeological interest is found, Contractor shall cease operations affecting the find and shall notify Owner. No further disturbance of the deposits shall ensue until Contractor has been notified by Owner that Contractor may proceed. Compensation to Contractor, if any, for lost time or changes in construction resulting from the find shall be determined in accordance with changed or extra work provisions of the Contract Documents.

1.21. DEWATERING OF SITE

- A. Work to be performed may require pumping and dewatering to complete the work as specified and as indicated on the Drawings. It is the intent of the specifications that such pumping and dewatering operation shall be the obligation of Contractor.
- B. Pumping and dewatering shall be considered incidental and subsidiary to other items of work for which direct payment is made. No separate payments will be made for this work.
- C. Contractor will be responsible for design, construction, electrical service and materials, operation, maintenance and permitting of any dewatering system necessary for the successful construction and completion of the project.
- D. Contractor shall conduct such investigation as is necessary to satisfy themselves of the groundwater conditions that will be encountered during the construction of the Work.

1.22. SUBSTANTIAL COMPLETION

- A. Refer to Section 00 77 00 – Closeout Procedures.
- B. Substantial Completion so that the Work can be utilized requires the following components to be complete, operational, and tested:
 - 1. Earthwork and Fine Grading

2. Below Grade Piping
3. Aggregate Surfacing
4. Seeding
5. Flexible Concrete Mat
6. Board Walk

PART 2 - PRODUCTS

2.1. AGGREGATE SURFACING

- A. Use 1" clean crushed rock for all aggregate surfacing.
- B. Related Section: 32 15 00 Aggregate Surfacing
- C. Aggregate surfacing shall be placed on prepared basecourse or existing undisturbed driving surface

2.2. AGGREGATE BASE COURSE

- A. Use 3" crushed rock for all aggregate base course
- B. Material shall be spread to 5" thickness on top of dirt subgrade, then incorporated or lightly disked into the subgrade. Once incorporated to a depth of approximately 6", contractor shall roll and compact the base course material prior to placement of aggregate surfacing.

2.3. SEEDING AND MULCHING

- A. Contractor shall use Native Prairie 7 with Oats mix as supplied by Miller Seed or approved equal.
- B. Contractor shall apply mulch immediately following seeding.
- C. Contractor shall follow manufacturers specifications for application and establishment.
- D. Related Section: 32 92 19 Seeding

2.4. RIPRAP

- A. Use Type A, B, and C rock riprap as specified by NDOT.
 1. Type B/C mix shall be mixed to a 50/50 ratio on-site and not at the quarry.
- B. Related Section: 31 37 00 Riprap

2.5. FLEXIBLE CONCRETE MAT

- A. Use Flexamat Standard, manufactured by Motz Enterprises, Inc or approved equal.
- B. Matting shall include erosion control matting anchored to the bottom of the block mat.

C. Contractor shall lightly scarify the area to be matted and broadcast seed at double the manufacturers specified rate prior to placement of the block mat.

D. Related Section: 32 14 50 Flexible Concrete Mat

2.6. STORMWATER PIPING

A. Use 12" nominal Corrugated Metal Pipe (CMP) for at least 10' at either end of the culvert.

B. Use 12" Fernco or approved equal to connect the CMP and Dual Wall HDPE sections.

C. Use N-12 Dual Wall HDPE as supplied by ADS or approved equal. 12" nominal bell and spigot joints with water tight gasket for the middle section of pipe.

D. Related Section: 33 40 00 Storm Drainage Piping

2.7. BOARDWALK LUMBER

A. Use lumber pressure treated with Chromated Copper Arsonate (CCA) to a concentration of 0.4 pounds per cubic foot.

B. Pressure treated wood shall not be cut in the field.

C. Related section: 06 10 00 Rough Carpentry

2.8. BOARDWALK HARDWARE

A. Use hot-dipped galvanized steel hardware, unless noted otherwise in the drawings.

B. Any cut or crimped ends shall be cold galvanized according to manufacturer's recommendations.

C. Expanded steel mesh for boardwalk traction shall have a hexagonal or diamond pattern. Base metal sheet shall have a minimum thickness of 13-gauge.

D. Related Section: 05 50 00 Metal Fabrications

PART 3 - EXECUTION

3.1. INTENT OF CONTRACT

A. The intent of the Contract is to make grading, surfacing, and trail stabilizing improvements to five sites at the Spring Creek Prairie Audubon Center:

1. Grade and surface the driveway and parking lot with a ditch. Install a culvert with riprap erosion control at the outlet to divert runoff from this site into a natural drainage. The result of this work will be to have a properly graded and surfaced area suitable for vehicle traffic which will divert most runoff water through a culvert and into a natural drainage. All disturbed non-driving areas must be restored with topsoil and seeding.
2. Grade and surface the east drive and ditch, including a grade control structure with culvert to accept runoff. The result of this work will be to have a properly

graded and surfaced area suitable for vehicle traffic which will divert most runoff water through a culvert and into a natural drainage with grade stabilizing riprap features. All disturbed non-driving areas must be restored with topsoil and seeding.

3. Grade a building pad for a future maintenance building. The result of this work will be to have a properly graded building pad suitable for future building construction.
 4. Install concrete block mat on the equipment crossing for the northwest drainage. The result of this work will be to have a stable trail which can be traversed by the Center's equipment without damage to the northwest drainage.
 5. Install a floating pedestrian boardwalk across the southeast drainage. The result of this work will be to have a stable boardwalk which can be traversed by visitors to the Center, and which will remain stable after seasonal flooding of the drainage.
- B. This Contract will cover completion in every detail of the work described in the Specifications or shown on the Drawings. The Contractor shall furnish all labor, materials, supervision, equipment, tools, transportation, and supplies required to complete the work in accordance with the Plans, Specifications, and terms of the Contract.

3.2. DESCRIPTION OF THE PROJECT

A. General Work at Sites 1 and 2:

1. Remove topsoil from excavation areas to a depth of approximately 6", and stockpile for re-use. The contractor is encouraged to cut and roll back topsoil with root systems intact to facilitate recovery of the natural vegetation.
2. Cut ditches to the depths and slopes indicated.
3. Place fill where indicated. Compact placed fill in steps as required to achieve 95% Modified Proctor density. Add water as needed to achieve optimal moisture content for compaction.
4. Add indicated quantity of aggregate rock to driving surfaces.
5. Install a culvert between the driveway ditch toe and the natural drainage to the south. Both pipe ends shall be corrugated metal pipe, with plastic pipe in the center of the culvert. Install riprap at the discharge of the culvert.
6. Re-apply salvaged sod and topsoil on all surfaces which are not to be used for driving, and re-seed these areas.

B. General Work at Site 3:

1. Remove topsoil from fill area, and stockpile for re-use

2. Add fill material from Sites 1 and 2 to the building pad. Compact placed fill in steps as required to achieve 95% Modified Proctor density. Add water as needed to achieve optimal moisture content for compaction.
- C. General Work at Site 4:
1. Install concrete block mat on the equipment trail where indicated. Install the mat according to these construction documents and manufacturer's instructions.
- D. General Work at Site 5:
1. Remove and dispose of old boardwalk sections
 2. Drive anchoring posts where indicated
 3. Construct the Boardwalk
 4. Connect the walkway sections and anchor to the piles on either side of the drainage

3.3. PRECONSTRUCTION MEETING

- A. Engineer shall schedule a meeting after the contract documents are executed.
- B. Attendance Required:
1. Owner.
 2. Engineer.
 3. Contractor.
 4. Subcontractors.
 5. Utilities.
- C. Agenda:
1. Designation of project representatives for Owner, Engineer and Contractor.
 2. Procedures and processing of field decisions, submittals, substitutions, applications for payments, proposal request, change orders and contract closeout procedures.
 3. Project scheduling.
 4. Review scope of project and project specific items.
- D. Record minutes and distribute copies after meeting to participants.

END OF SECTION

SECTION 01 45 00 - QUALITY CONTROL**PART 1 - GENERAL****1.1. SECTION INCLUDES**

- A. Quality assurance and control of installation.
- B. References.

1.2. RELATED SECTIONS

- A. Not used

1.3. QUALITY ASSURANCE/CONTROL OF INSTALLATION

- A. Monitor quality control over suppliers, manufacturers, Products, services, site conditions, and workmanship, to produce Work of specified quality.
- B. Comply fully with manufacturers' instructions, including each step in sequence.
- C. Should manufacturers' instructions conflict with Contract Documents, request clarification from Architect/Engineer before proceeding.
- D. Comply with specified standards as a minimum quality for the Work except when more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.
- E. Perform work by persons qualified to produce workmanship of specified quality.
- F. Secure Products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion or disfigurement.

1.4. REFERENCES

- A. Conform to reference standard by date of issue current on date of Contract Documents.
- B. Obtain copies of standards when required by Contract Documents.
- C. Should specified reference standards conflict with Contract Documents, request clarification from Architect/Engineer before proceeding.
- D. The contractual relationship of the parties to the Contract shall not be altered from the Contract Documents by mention or inference otherwise in any reference document.

PART 2 - PRODUCTS (NOT USED)**PART 3 - EXECUTION (NOT USED)****END OF SECTION**

SECTION 01 74 00
CLEANING AND WASTE MANAGEMENT

PART 1 - GENERAL

1.1. SECTION INCLUDES

- A. Disposal Requirements.
- B. Cleaning Materials.
- C. Final Cleaning.

1.2. RELATED SECTIONS

- A. Section 01 10 00 – Special Provisions

1.3. DISPOSAL REQUIREMENTS

- A. Conduct cleaning and disposal operations to comply with codes, ordinances, regulations, and anti-pollution.
- B. Legally dispose of all debris and materials at a site approved by the local governing body. The Contractor shall pay all fees at dump site.

1.4. CLEANING MATERIALS

- A. Use only those cleaning materials which will not create hazards to health or property and which will not damage surfaces.
- B. Use only those cleaning materials and methods recommended by the manufacturer of the surface material to be cleaned.
- C. Use cleaning materials only on surfaces recommended by cleaning material manufacturer.

1.5. FINAL CLEANING

- A. Employ skilled workmen for final cleaning.
- B. Remove all construction debris and other foreign materials from sight-exposed exterior areas covered under the scope of Work for this project.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01 77 00
CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1. SECTION INCLUDES

- A. Substantial and Final Inspection.
- B. Contractor's Closeout Submittals.
- C. Final Adjustments of Accounts.
- D. Final Application for Payment.
- E. Written Guarantees.
- F. Equipment List and Maintenance Manual.
- G. Record Drawings.

1.2. RELATED SECTIONS

- A. 01 10 00 – Special Provisions
- B. Section 01 74 00 – Cleaning and Waste Management.
- C. Closeout Submittals Required of Trades: The respective sections of Specifications.

1.3. SUBSTANTIAL AND FINAL INSPECTIONS

- A. When the Contractor considers that the Work is substantially complete, the Contractor shall prepare and submit to the Architect/Engineer a Request for Substantial Inspection with a comprehensive list of items to be completed or corrected prior to final payment. Allow a minimum of 7 days advance notice for scheduling purposes. Failure to include an item on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents.
- B. Upon receipt of the Contractors list, the Architect/Engineer will make an inspection to determine whether the Work is substantially complete. If the Architect/Engineer inspection discloses any item, whether or not included on the Contractors list, which is not sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work for its intended use, the Contractor shall, before issuance of the Certificate of Substantial Completion, complete or correct such item upon notification by the Architect/Engineer. In such case, the Contractor shall then submit a request for another inspection by the Architect/Engineer to determine Substantial Completion.
- C. Re-inspection Procedure: If it is determined that the project is not substantially complete, the Owner/Engineer will re-inspect the Work upon receipt of notice

that the Work, including inspection list items from the first inspection, has been completed, except for items whose completion is delayed under circumstances to the Owner.

1. All costs associated with the re-inspection shall be borne by the Contractor. The Owner shall be accorded a Contract Sum adjustment by deductive Change Order.
 2. Upon completion of re-inspection, if the Work is incomplete, the Owner/Engineer will advise the Contractor of Work that is incomplete or of obligations that have not been fulfilled but are required for substantial completion.
 3. If necessary, re-inspection will be repeated and all cost associated with the re-inspection shall be borne by the Contractor and the Owner shall be accorded a Contract Sum adjustment by deductive Change Order.
- D. When the Work is substantially complete, the Architect/Engineer will prepare a Certificate of Substantial Completion that shall establish the date of Substantial Completion. Substantial Completion shall establish the date of responsibilities of the Owner and Contractor for security, maintenance, heat, utilities, damage to the Work and insurance, and shall fix the time within which the Contractor shall finish all items on the list accompanying the Certificate. Warranties required by the Contract Documents shall commence on the date of Substantial Completion of the Work unless otherwise provided in the certificate of Substantial Completion.
- E. The Certificate of Substantial Completion shall be submitted to the Owner and Contractor for their written acceptance of responsibilities assigned to them in such Certificate.
- F. Upon receipt of written notice that the Work is ready for final inspection and acceptance, the Architect/Engineer will make such inspection. Allow a minimum of 7 days advance notice for scheduling purposes.
- G. Re-inspection Procedure: The Owner/Engineer will re-inspect the Work upon receipt of notice that the Work, including inspection list items from earlier inspections, has been completed, except for items whose completion is delayed under circumstances to the Owner.
1. All costs associated with the re-inspection shall be borne by the Contractor. The Owner shall be accorded a Contract Sum adjustment by deductive Change Order.
 2. Upon completion of re-inspection, the Owner/Engineer will prepare a Certificate of Final Acceptance.
 3. If the Work is incomplete, the Owner/Engineer will advise the Contractor of Work that is incomplete or of obligations that have not been fulfilled but are required for final acceptance.

4. If necessary, re-inspection will be repeated and all cost associated with the re-inspection shall be borne by the Contractor and the Owner shall be accorded a Contract Sum adjustment by deductive Change Order.
- H. Should the Architect/Engineer find all work satisfactory at the time of final inspection, Contractor will be allowed to make application for final payment in accordance with provisions of the Contract regarding final payment. Should Architect/Engineer still find deficiencies in the Work, Contractor will be notified in writing of such deficiencies and final payment will not be approved until Contractor has completed the required work.

1.4. CONTRACTOR'S CLOSEOUT SUBMITTALS TO OWNER

- A. Project Document Records: To requirements of Section 01 10 00
- B. Send three (3) sets of Project Document Records to Architect/Engineer for distribution.

1.5. FINAL ADJUSTMENTS OF ACCOUNTS

- A. Submit a final statement of account to Owner.
- B. Statement shall reflect all adjustments to the original Contract Sum.
- C. Additions and deductions resulting from:
 1. Previous change orders.
 2. Deductions for uncorrected Work.
 3. Other deductions.
- D. Total Contract Sum, as adjusted.
- E. Previous payments.
- F. Sum remaining due.

1.6. FINAL APPLICATION FOR PAYMENT

- A. Contractor shall submit the final Application for Payment in accordance with procedures and requirements stated in the Contract.

1.7. WRITTEN WARRANTIES

- A. Warranties start from date of Substantial Completion.

1.8. RECORD DRAWINGS

- A. Upon completion of the work and before final payment is made, the Contractor shall furnish the Owner with a set of record drawings which record and indicate all work actually constructed and installed, including all modifications and additions thereto.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 05 50 00
METAL FABRICATIONS

PART 1 - GENERAL

1.1. SECTION INCLUDES

- A. Shop fabricated steel and stainless steel items.
- B. Steel and stainless steel cables and fasteners.
- C. Steel and stainless steel expanded metal sheets.

1.2. RELATED REQUIREMENTS

- A. Not Used

1.3. REFERENCE STANDARDS

- A. ASTM A 36/A 36M - Standard Specification for Carbon Structural Steel; 2008.
- B. ASTM A 123/A 123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2009.
- C. ASTM A 153/A 153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2009.
- D. ASTM A 325 - Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength; 2009a.
- E. ASTM A 325M - Standard Specification for Structural Bolts, Steel, Heat Treated 830 MPa Tensile Strength (Metric); 2009.
- F. SSPC-Paint 20 - Zinc-Rich Primers (Type I, "Inorganic," and Type II, "Organic"); Society for Protective Coatings; 2002 (Ed. 2004).

1.4. SUBMITTALS

- A. See Section 01 10 00 – Special Provisions, for submittal procedures.

PART 2 - PRODUCTS

2.1. MATERIALS - STEEL

- A. Miscellaneous Steel Sections and Plate: ASTM A 36/A 36M.
- B. Bolts, Nuts, and Washers: ASTM A 325 (ASTM A 325M), Type 1, galvanized to ASTM A 153/A 153M where connecting galvanized components.
- C. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20, Type I - Inorganic, complying with VOC limitations of authorities having jurisdiction.

2.2. MATERIAL - STAINLESS STEEL

- A. Stainless Steel Plate: ASTM A240, Type 316L

2.3. FABRICATION

- A. Fit and shop assemble items in largest practical sections, for delivery to site.
- B. Fabricate items with joints tightly fitted and secured.
- C. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.
- D. Supply components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.

2.4. FINISHES - STEEL

- A. Hot dip galvanize all steel items.
- B. Galvanizing of Non-structural Items: Galvanize after fabrication to ASTM A 123/A 123M requirements.

PART 3 - EXECUTION

3.1. EXAMINATION

- A. Verify that field conditions are acceptable and are ready to receive work.

3.2. INSTALLATION

- A. Install items plumb and level, accurately fitted, free from distortion or defects.
- B. Provide for erection loads, and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.
- C. Obtain approval prior to site cutting or making adjustments not scheduled.
- D. After erection, coat welds, abrasions, and surfaces not galvanized. Coat with cold zinc galvanizing.

3.3. TOLERANCES

- A. Maximum Out-of-Position: 1/4 inch.

END OF SECTION

SECTION 06 10 00
ROUGH CARPENTRY

PART 1 - GENERAL

1.1. SECTION INCLUDES

- A. Wood-fabricated structures
- B. Preservative treatment.

PART 2 - PRODUCTS

2.1. MATERIALS

- A. Lumber Standards: Manufactured lumber to comply with PS 20 "American Softwood Lumber Standard" and with applicable grading rules of inspection agencies certified by American Lumber Standards Committee's (ALSC) Board of Review.
- B. Inspection Agencies: Inspection agencies and the abbreviations used to reference with lumber grades and species include the following:
 - 1. WCLIB - West Coast Lumber Inspection Bureau
 - 2. WWPA - Western Wood Products Association.
- C. Factory-mark each piece of lumber with grade stamp of inspection agency evidencing compliance with grading rule requirements and identifying agency, grade, species, moisture content at time of surfacing, and mill.
- D. Nominal sizes are indicated, except as shown by detail dimensions. Provide actual sizes as required by PS 20, for moisture content specified for each use.
 - 1. Provide dressed lumber, S4S, unless otherwise indicated.
 - 2. Provide seasoned lumber with 19 % maximum moisture content at time of dressing and shipment for sizes 2" or less in nominal thickness, unless otherwise indicated.

2.2. DIMENSION LUMBER

- A. For all lumber, provide the following grade and species:
 - 1. No. 2 grade or better, Douglas Fir or Douglas Fir-Larch graded, respectively, under WCLIB or WWPA rules.

2.3. MISCELLANEOUS LUMBER

- A. Provide wood for support or attachment of other work including cant strips, bucks, nails, blocking, furring, grounds, stripping and similar members. Provide lumber of sizes indicated, worked into shapes shown.
- B. Moisture Content: 19 % maximum for lumber items not specified to receive wood preservative treatment.

- C. Grade: Standard Grade light framing size lumber of any species or board size lumber as required. No. 3 Common or Standard Grade boards per WCLIB or WWPA rules.

2.4. PRESERVATIVE TREATMENT

- A. Treatment shall be CCA (Chromated Copper Arsenate)
- B. CCA treated wood shall be kiln dried after treatment to a moisture content of 19% or less for lumber and 18% or less for plywood.
- C. CCA treated wood meets the applicable building code requirements for above ground and ground contact use
- D. Grade marked lumber treated with CCA shall be in accordance with PS 20

2.5. MISCELLANEOUS MATERIALS

- A. Fasteners and Anchorages: Provide size, type, material and finish as indicated and as recommended by applicable standards, complying with applicable Federal Specifications for nails, staples, screws, bolts, nuts, washers and anchoring devices. Provide metal hangers and framing anchors of the size and type recommended by the manufacturer for each use including recommending nails.
 - 1. Where rough carpentry work is exposed to weather, in ground contact, or in area of high relative humidity, provide fasteners and anchorages with a hot-dip zinc coating (ASTM A153).

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 31 10 00**SITE CLEARING****PART 1 - GENERAL****1.1. SECTION INCLUDES**

- A. Remove surface debris.
- B. Removal of vegetation and sod.
- C. Remove trees, shrubs and other plants.
- D. Remove root system of trees and shrubs.
- E. Disposal.

1.2. REGULATORY REQUIREMENTS

- A. Conform to local, state, and federal regulations for disposal of debris.
- B. Contractor shall obtain, at Contractor's own expense, all permits or licenses for the use and maintaining of dumps and waste areas.
- C. Coordinate clearing work with utility Owners.
- D. Conform to local, state, and federal regulations for preparation and implementation of erosion control plan.

1.3. UNIT PRICES

- A. General Clearing and Grubbing:
 - 1. Includes:
 - a. Clearing: Removal and disposal of all unwanted material from the surface, such as trees/stumps vegetation, boulders. and trash.
 - b. Grubbing: Removal and disposal of all unwanted materials from underground, such as boulders, stumps, roots. or other debris.
 - c. Backfill: Backfill required to fill cavities resulting from any removal shall be included in the cost of the clearing and grubbing.
 - 2. Method of Measurement and Pay Unit: lump sum.
- B. Tree and/or Stump Removal:
 - 1. Includes trees and stumps (including root ball). Backfill required to fill cavities resulting from the removals shall be included in the cost of the removal.
 - 2. Method of Measurement and Pay Unit: lump sum.

1.4. PROJECT CONDITIONS

- A. Conform to applicable regulations relating to environmental requirements, disposal of debris, use of herbicides and hazardous materials.

- B. Coordinate clearing work with utility companies.
- C. Protect utilities to remain from damage.
- D. Protect trees, plants, amenities and other features designated to remain as final landscaping.
- E. Protect benchmarks, survey control points and existing structures from damage or displacement.

PART 2 - PRODUCTS

2.1. MATERIALS

- A. On site soils that are planned for fill on remainder of the project.

PART 3 - EXECUTION

3.1. PREPARATION

- A. Locate and identify utilities to remain. Tag utilities to be removed.
- B. Verify that existing plants designated to remain are tagged or identified.
- C. Tag existing plants designated to remain.
- D. Identify a waste area/salvage area for placing removed materials.

3.2. CLEARING

- A. Clear areas required for access to site and execution of work.
- B. Remove trees, shrubs and stumps within limits of construction.
- C. Remove roots to a depth of 36 inches.
- D. Clear undergrowth and deadwood without disturbing subsoil.
- E. Remove existing sod or vegetation.

3.3. REMOVAL

- A. Remove surface rock.
- B. Remove debris from site.

3.4. SALVAGED MATERIALS

- A. Carefully remove, load, transport, unload, and store materials and items designated as salvage.
- B. Reinstall salvage material and items as shown on the plans.

3.5. DISPOSAL

- A. Remove waste material from project site promptly as it is generated by construction operations; do not permit to accumulate. Unless directed, do not remove topsoil from the site.

- B. Remove brush, trees, stumps, roots, rubbish, spoil, excess excavated material and material not suitable for backfill to off-site location of Contractor's choice, cost to be incidental to the removal.
- C. Disposal areas shall be Contractor's responsibility unless otherwise indicated in Section 01 10 00 - Special Provisions.
- D. Grade final cover to allow for positive surface drainage.
- E. Haul Routes:
 - 1. Determine haul roads with approval of agency having jurisdiction over proposed roadway.
 - 2. Document the condition of haul roads with necessary photographs and written descriptions.
 - 3. Keep reasonably free from dirt, dust, mud and other debris from construction operations.
 - 4. Repair any damaged haul roads to match existing conditions before use.
 - 5. Temporary haul routes (roads) developed by the Contractor shall be completely removed at the completion of the project and the area returned to its original condition. The cost of temporary haul routes shall be included in the cost of the project.

END OF SECTION

SECTION 31 22 00
GRADING, EXCAVATION AND EMBANKMENT

PART 1 - GENERAL

1.1. SECTION INCLUDES

- A. Removal, storage, and placement of topsoil.
- B. Rough grading for site improvements.
- C. Building, Shaping, Excavation and/or Embankment for:
 - 1. Building volume below grade, footings, pile caps, site structures, box culverts, and general grading and fills.
 - 2. Roadbeds, subgrades, shoulders, bridge approaches and private entrances.
 - 3. Slopes, dikes, channels and ditches needed for drainage.
 - 4. Stripping of all unsuitable materials.
 - 5. Obtaining soils from off-site borrow pit.

1.2. REFERENCES

- A. State Standard Specifications, latest edition.
- B. AASHTO T 180 – Standard Specification for Moisture – Density Relations of Soils Using a
- C. 4.54 kg (10-lb) Rammer and a 457 mm (18 inch) Drop: American Association of State Highway and Transportation Officials.
- D. ASTM C 136 –Standard Test Method for Sieve Analysis of Fine Coarse Aggregates.
- E. ASTM D 698 – Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft³ (600 kN-m/m³))
- F. ASTM D 1556 – Standard Test Method for Density and Unit Weight of Soil in Place by Sand-Cone Method.
- G. ASTM D 1557 –Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft³).
- H. ASTM D 2167 –Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method.
- I. ASTM D 2487 –Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System).
- J. ASTM D 6938 –Test Methods for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth).

- K. J. ASTM D 4318 –Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.

1.3. UNIT PRICES

A. Topsoil:

1. Includes excavating existing topsoil, stockpiling, scarifying substrate surface, supplying, placing topsoil where required and compacting.
2. The loading, hauling and disposal of surplus material at a site of the contractor's
3. choice is considered subsidiary to excavating existing topsoil.

B. Earthwork as Excavation:

1. Payment may be made by Established Quantity OR per Cubic Yard (CY). If paid for per cubic yard, measurement shall be based on a post construction survey or other agreed upon method of measurement between Engineer and Contractor.
2. If paid by Established Quantity, plan quantity(s) not field measured upon completion of project,
3. The loading, hauling and disposal of surplus material at a site of the contractor's
4. choice is considered subsidiary.
5. Includes excavation, placing where required, compacting soils to the elevations shown in the drawings and water applied to obtain compaction.

C. Earthwork as Embankment:

1. Payment may be made by Established Quantity OR per Cubic Yard (CY). If paid for per cubic yard, measurement shall be based on a post construction survey or other agreed upon method of measurement between Engineer and Contractor.
2. If paid by Established Quantity, plan quantity not field measured upon completion of project.
3. Contractor may be required to furnish borrow material – See plans and or Section 01 10 00 – Special Provisions.
4. No Additional Compensation for:
 - a. Additional material required to obtain compaction.
 - b. Material placed outside of limit of typical cross section.
 - c. Material placed to correct settlement of embankment.
 - d. Water applied to obtain compaction.
5. Includes excavation, supplying, placing where required, compacting soils to the elevations shown in the drawings and water applied to obtain compaction.

D. Unsuitable Materials:

1. Includes excavating materials which are determined by Engineer to be unsuitable, loading and removal of unsuitable material from site, and furnish and backfill with materials specified by Engineer.
2. Method of Measurement and Pay Unit: By the cubic yard (measured in place).

1.4. SUBMITTALS

- A. Project Record Documents: Contractor shall accurately record actual locations of utilities remaining by horizontal dimensions, elevations or inverts, and slope gradients.
- B. Materials Sources: Submit name of imported materials source.

1.5. QUALITY ASSURANCE

- A. Perform work in accordance with State Standard Specifications, Section 01 45 00 – Quality Requirements and Section 01 10 00 – Special Provisions.

1.6. PROJECT CONDITIONS

- A. Protect above and below-grade utilities that remain.
- B. Protect plants, lawns, rock outcroppings, amenities and other features to remain as a portion of final landscaping.
- C. Protect benchmarks, survey control points, existing structure, fences, sidewalks, paving, curbs, batter boards and amenities from excavating equipment and vehicular traffic.

PART 2 - PRODUCTS

2.1. MATERIALS

- A. See Section 31 23 23 – Fill and Backfill for material specifications.
- B. Water required for grading is Contractor's responsibility. The cost of furnishing water will not be a direct pay item, unless specified otherwise, but is to be included in other items for which payment is made.

PART 3 - EXECUTION

3.1. EXAMINATION

- A. Verify that survey benchmark and intended elevations for the work are as indicated. This would include GPS system setup by establishing site control using control points provided by the Engineer.

3.2. PREPARATION

- A. Identify required lines, levels, contours and datum.
- B. Stake and flag locations of known utilities.
- C. Locate, identify and protect utilities that remain from damage.
- D. Notify utility owner to remove and relocate utilities when relocation is required.

- E. If staking is required by others, notify the party providing the staking with sufficient notice to not delay the project.
- F. Implement erosion control plan.

3.3. EXCAVATING

- A. Underpin adjacent structures which may be damaged by excavating work. All liability for damage to existing structures is the responsibility of the Contractor. Consultation with a geotechnical firm for recommendations is recommended to limit liability.
- B. Excavate to accommodate new structures.
- C. Notify Engineer of unexpected subsurface conditions and discontinue affected work in area until notified to resume work.
- D. Slope bank of excavations deeper than 3 feet to angle of repose or less until shored. Follow all AASHTO requirements.
- E. Do not interfere with 45 degree bearing splay of foundations. Contact a geotechnical firm for recommendations if this cannot be accommodated.
- F. Hand trim excavations. Remove loose materials.
- G. Remove lumped subsoil, boulders and rock.
- H. Correct areas that are over-excavated and load-bearing surfaces that are disturbed.
- I. Grade top perimeter of excavation to prevent surface water from draining into excavation.
- J. Remove excavated material that is unsuitable for reuse from site.
- K. Remove excess excavated material from site.

3.4. ROUGH GRADING

- A. Remove topsoil within the limits of construction (LOC) without mixing with foreign materials and stockpile. Minimum depth of topsoil removal shall be 6 inches unless otherwise noted in the geotechnical report or on the drawings.
- B. Do not remove topsoil when wet.
- C. Remove subsoil from areas to be further excavated, re-landscaped or re-graded.
- D. Do not remove wet subsoil unless it is subsequently processed to obtain optimum moisture content.
- E. When excavating through roots, perform work by hand and cut roots with sharp axe or saw.
- F. Benching Slopes: Horizontally bench existing slopes greater than 1 foot vertical rise in 4 feet to key fill material to slope for firm bearing.
- G. Stability: Replace damaged or displaced subsoil to same requirements as for specified fill.

- H. Employ a compaction method that achieves the specified minimum compaction requirements as specified in Section 31 23 23 – Fill and Backfill
- I. Employ a placement method that does not disturb or damage other work.
- J. Do not fill over porous, wet, frozen or spongy subgrade surfaces.
- K. Pre-watering, if required, shall be defined and paid for within the Section 01 10 00 Special Provisions.
- L. Maintain optimal moisture levels to attain required compaction density.
- M. Granular Fill: Place and compact materials in equal, continuous layers not exceeding 6 inches compacted depth or as indicated by a Geotechnical Report
- N. Maintain graded surface in Such Condition That:
 - 1. It drains at all times.
 - 2. Side ditches are constructed to avoid damage to embankments by erosion.
 - 3. Slopes are trimmed accurately.
 - 4. Avoid loosening material below or outside of the required slopes, remove all breakage and slides.
 - 5. Excavate as shown in the drawings.
 - 6. Finished grade matches the lines, grades and cross sections shown in the drawings and in the GPS surface model provided by the Engineer.

3.5. SOIL REMOVAL AND STOCKPILING

- A. Stockpile topsoil to be reused on site. Remainder to be removed from site and disposed of at a location of the contractor's choice, unless otherwise stated in Section 01 10 00 – Specials Provisions.
- B. Stockpiles: Use areas designated; protect from erosion.

3.6. FINISH GRADING

- A. Before Finish Grading:
 - 1. Verify building and trench backfilling have been inspected.
 - 2. Verify subgrade has been contoured and compacted.
- B. Remove debris, roots, branches and stones in excess of 1 inch in size.
- C. Where topsoil is to be placed, scarify surface to depth of 6 inches.
- D. In areas where vehicles or equipment have compacted soil, scarify surface to depth of 6 inches.
- E. Place topsoil in areas where seeding, sodding and planting are indicated.
- F. Place topsoil to the following compacted thicknesses:

1. Areas to be Seeded with Grass: 6 inches.
 2. Areas to be Sodded: 4 inches.
 3. Shrub Beds: 8 inches.
- G. Place topsoil during dry weather.
- H. Remove roots, weeds, rocks and foreign material while spreading.
- I. Near trees, shrubs and buildings, spread topsoil manually to prevent damage.
- J. Fine grade topsoil to eliminate uneven areas and low spots. Maintain profiles and contour of subgrade.

3.7. HAUL ROUTES

- A. Determine haul roads with approval of agency having jurisdiction over proposed project.
- B. Make condition survey of haul roads prior to use and document with necessary photographs and written descriptions.
- C. Keep reasonably free from dirt, dust, mud and other debris from construction operations.
- D. Clean a minimum of twice a week.
- E. Repair any damaged haul roads to match existing conditions before use.
- F. No extra payment shall be made for removals regardless of disposal locations.
- G. Temporary haul routes (roads) developed by the Contractor shall be completely removed at the completion of the project and the area returned to its original condition. The cost of temporary haul routes shall be incidental to the cost of the project.

3.8. TOLERANCES

- A. Top Surface of Finish Grade and/or Subgrade: Plus or minus 0.1 feet from plan/model elevation.

3.9. CLEANING AND PROTECTION

- A. Prevent displacement of banks and keep loose soil from falling into excavation; maintain soil stability.
- B. Protect bottom of excavations and soil adjacent to and beneath foundation from freezing.
- C. Remove unused stockpiled topsoil and subsoil. After removing all stockpiles, grade areas to prevent standing water. Maintain drainage away from buildings and structures at a 2 percent grade or as indicated on the drawings.
- D. Leave site clean and raked, ready to seed, sod or landscape.

END OF SECTION

SECTION 31 23 23
FILL AND BACKFILL

PART 1 - GENERAL

1.1. SECTION INCLUDES

- A. Filling, backfilling and compacting for building volume below grade, footings, slabs-on-grade, paving, site structures and utilities all within the building envelope, and pile caps.
- B. Filling holes, pits and excavations generated as a result of removal operation.
- C. Backfilling around and outside of structures.

1.2. REFERENCES

- A. AASHTO T 180 – Standard Method of Test for Moisture-Density Relations of Soils Using a 4.54-kg (10-lb) Rammer and a 457-mm (18-in.) Drop; American Association of State Highway and Transportation Officials.
- B. ASTM C 136 – Standard Test Method for Sieve Analysis of Fine Coarse Aggregates.
- C. ASTM D 698 – Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lb/ft³ (600 kN-m/m³)).
- D. ASTM D 1556 – Standard Test Method for Density and Unit Weight of Soil in Place by Sand-Cone Method.
- E. ASTM D 1557 – Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft³).
- F. ASTM D 2167 – Standard Test Method for Density and Unit Weight of Soil in Place by Rubber Balloon Method.
- G. ASTM D 2487 – Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System).
- H. ASTM D 6938 – Standard Test Methods for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth).
- I. ASTM D 4318 – Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.
- J. State Standard Specifications for Highway Construction, latest edition, including all current supplemental specifications.

1.3. UNIT PRICES

- A. Fill and backfill is considered subsidiary to the work included in the project.

1.4. SUBMITTALS

- B. Materials Sources: Submit name of imported materials source.

1.5. PROJECT CONDITIONS

- A. Provide sufficient quantities of fill to meet project schedule and requirements. When necessary, store materials on-site in advance of need.
- B. When fill materials need to be stored on-site, locate stockpiles where designated.
 - 1. Separate differing materials with dividers or stockpile separately to prevent intermixing.
 - 2. Prevent contamination.
 - 3. Protect stockpiles from erosion and deterioration of materials.
- C. Verify that survey benchmarks and intended elevations for work are as indicated.

PART 2 - PRODUCTS**2.1. FILL MATERIALS**

- A. Fill Materials: All recommendations in the geotechnical report shall be followed. In the absence of a geotechnical report, the fill materials shall meet the criteria stated in this section.
- B. Non-structural Fill: Subsoil excavated on-site.
 - 1. Material should not contain an appreciable amount of roots, rock, or debris, and should not contain any foreign material with a dimension greater than 2 inches.
 - 2. ASTM C 2487 classification: GW, GP, GM, GC, SC, SW, SP, SM, ML, CL-ML or CL. No CH materials shall be used unless specific moisture conditioning is used. In the top 12 inches of embankment fills, only cohesive soils shall be used (ML, CL-ML, or CL).
 - 3. Liquid limit: Less than 45.
 - 4. Maximum plasticity index: 20.
 - 5. See Geotechnical Report for additional information, if available.
- C. Structural Fill: Subsoil excavated on-site.
 - 1. Low volume change cohesive soils, free of organic matter, rocks or foreign material.
 - 2. ASTM D 2487 classification: CL, ML, or CL-ML. No CH materials shall be used unless specific moisture conditioning is used.
 - 3. Liquid limit: Less than 45.
 - 4. Maximum plasticity index: 20.
 - 5. See Geotechnical Report for additional information, if available.
- D. Flowable Fill:

1. A mixture of cement, fly ash, fine sand, water and air having a consistency which will flow under a very low head.
 2. Approximate quantities, per cubic yard:
 - a. Cement (Type II): 50 Lbs.
 - b. Fly ash: 200 Lbs.
 - c. Fine Sand: 2,700 Lbs.
 - d. Water: 420 Lbs.
 - e. Air Content: 10 percent
 3. Compressive Strength: 85 to 175 psi.
- E. Topsoil: Topsoil excavated on-site.
1. Unclassified.
 2. Free of roots, rocks, subsoil, debris, large weeds and foreign matter.
- F. Water: Water required for fill and backfill is Contractor's responsibility. The cost of furnishing water will not be a direct pay item but is to be included in other items for which payment is made, unless stated otherwise.

2.2. SOURCE QUALITY CONTROL

- A. Where fill materials are specified by reference to a specific standard, test and analyze samples for compliance before delivery to site.
- B. If tests indicate materials do not meet specified requirements, change material and retest.
- C. Provide materials of each type from same source throughout the work.

PART 3 - EXECUTION

3.1. EXAMINATION

- A. Identify required lines, levels, contours and datum locations.
- B. Verify subdrainage, dampproofing or waterproofing installation has been inspected.
- C. Verify structural ability of unsupported walls to support imposed loads by the fill.

3.2. PREPARATION

- A. Scarify and proof roll (with a loaded dump truck) subgrade surface to a depth of 6 inches to identify soft spots.
- B. Over-excavate soft areas of subgrade identified during proof rolling not capable of compaction in place. Backfill with specified fill.
- C. Compact subgrade to density equal to or greater than requirements for subsequent fill material.

- D. Until ready to fill, maintain excavations and prevent loose soil from falling into excavation.

3.3. FILLING AND BACKFILLING

- A. Fill to contours and elevations indicated using unfrozen materials of the type specified in Section 2.
- B. Employ a placement method that does not disturb or damage other work.
- C. Systematically fill to allow maximum time for natural settlement. Do not fill over porous, wet, frozen or spongy subgrade surfaces.
- D. Soil moisture control - Maintain soil moisture content within the recommended range specified in the geotechnical report. If no geotechnical report has been prepared use the following moisture ranges.
 - 1. Building subgrades, foundation soils, paving subgrades, or embankment fills shall have a moisture range of +/- 4% from optimum moisture as determined using ASTM D 698.
 - 2. Backfill that will not have paving or other structures over it may have a moisture range of +/-5% from optimum moisture as determined using ASTM D 698.
- E. Minimum compaction – The minimum compaction for each area shall meet or exceed the recommended minimums specified in the geotechnical report. If no geotechnical report has been prepared use the following moisture ranges.
 - 1. Building subgrades, foundation soils, paving subgrades, or embankment fills shall have a minimum compaction of 95% of the maximum dry density as determined using ASTM D 698.
 - 2. Backfill that will not have paving or other structures over it shall have a minimum compaction of 92% of the maximum dry density as determined using ASTM D 698.
- F. Fill and Backfill Placement
 - 1. In the areas of building subgrades, foundation soils, paving subgrades, or embankment fills, place and compact materials in equal, continuous layers not exceeding 6 inches compacted depth (as recommended in geotechnical report or Section 01 10 00– Special Provisions).
 - 2. In the areas that will not have paving or other structures over, place and compact materials in equal, continuous layers not exceeding 12 inches compacted depth (as recommended in geotechnical report or Section 01 10 00– Special Provisions).
- G. Slope grade away from building minimum 2 percent or as shown on the plans. Make gradual grade changes. Blend slope into level areas.
- H. Correct areas that are over-excavated.
 - 1. Load-Bearing Foundation Surfaces: Use structural fill, prepared to the required elevation, compacted per the geotechnical report or Section 01 10 00 – Special Provisions.

2. Other Areas: Use non-structural fill, prepared to the required elevation, compacted as per the geotechnical report or Section 01 10 00 – Special Provisions.
- I. Compaction density(s) shall be as recommended in the geotechnical report or Section 01 10 00 – Special Provisions.
- J. Reshape and recompact areas subjected to vehicular traffic.

3.4. EROSION CONTROL

- A. All areas of new dirt work that are not rocked or paved shall be seeded and mulched or be covered with an erosion control blanket.

3.5. TOLERANCES

- A. The finish subgrade (top of dirt) shall be +/- 0.1 foot from plan elevations.

3.6. FIELD QUALITY CONTROL

- A. Compaction density testing shall be performed on compacted fill in accordance with ASTM D 1556, ASTM D 2167, or ASTM D 6938.
- B. Results shall be evaluated in relation to compaction curve determined by testing uncompacted material in accordance with ASTM D 698 "standard proctor", ASTM D 1557 "modified proctor" or AASHTO T 180.
- C. If tests indicate work does not meet specified requirements, remove work, replace and retest. Removal area shall include all area up to the adjacent passing test.
- D. Frequency of Tests:
 1. Test randomly.
 2. Under Paving, Slabs-on-Grade and Similar Construction: A minimum of 1 test per foot of fill per 100' x 100' area or as determined by Engineer.
- E. Proof roll compacted fill at surfaces that will be under slabs-on-grade, pavers and paving.

3.7. CLEANUP

- A. Remove unused stockpiled materials; leave area in a clean and neat condition. Grade stockpile area to prevent standing surface water.
- B. Leave borrow areas in a clean and neat condition. Grade to prevent standing surface water.

END OF SECTION

SECTION 31 37 00**RIPRAP****PART 1 - GENERAL****1.1. SECTION INCLUDES**

- A. Rock riprap.
- B. Broken concrete riprap.

1.2. UNIT PRICES**A. Rock Riprap:**

1. Method of Measurement and Pay Unit: By the ton for each respective type of rock riprap shown in the bid form.
2. Includes:
 - a. Supplying.
 - b. Weighing.
 - c. Hauling.
 - d. Placing where required.
3. Furnish load ticket for each load delivered.
4. Load ticket information.
 - a. Ticket number.
 - b. Project name.
 - c. Date.
 - d. Truck number.
 - e. Empty truck weight.
 - f. Gross weight.
 - g. Load weight in pound and tons.
5. Use only approved scales.
6. Give to Owner's representative prior to unloading material.
7. Payment based on load tickets.
8. No payment for material not accompanied with ticket.

B. Broken Concrete Riprap:

1. Method of Measurement and Pay Unit: By the ton.
2. Includes:
 - a. Supplying.
 - b. Weighing.
 - c. Hauling.
 - d. Placing where required.
 - e. Furnish and installation of filter fabric.
3. Furnish load ticket for each load delivered.
4. Load ticket information.
 - a. Ticket number.
 - b. Project name.
 - c. Date.
 - d. Truck number.
 - e. Empty truck weight.
 - f. Gross weight.
 - g. Load weight in pounds and tons.
5. Use only approved scales.
6. Give to Owner's representative prior to unloading material.
7. Payment based on load tickets.
8. No payment for material not accompanied with ticket.

1.3. QUALITY ASSURANCE

- A. Obtain aggregate materials from same source throughout project.

PART 2 - PRODUCTS

2.1. MATERIAL

- A. Rock Riprap:
 1. Gradations shall reference the applicable State Department of Transportation Standard Specifications or as indicated on the plans or special provisions.
- B. Broken Concrete Riprap:
 1. Reinforcing steel bars shall be cut off and removed.
 2. State Standard Specifications and as shown on the plans.

PART 3 - EXECUTION**3.1. EXAMINATION**

- A. Verify earth surface conforms to grades and slopes of the neat lines at the bottom surface of the riprap as shown in the drawings.
- B. Do not place over frozen, soft or unstable subgrade surfaces.
- C. Surface relatively smooth, free of obstructions.

3.2. PLACEMENT

- A. Rock Riprap or Broken Concrete:
 - 1. Place to line and grade as shown on the plans. Rock shall be placed to provide a homogenous mixture of the gradation specified.
 - 2. Care shall be taken to minimize the number of times material is hauled, moved, and placed so that material quality and gradation is not representative of what is specified.
 - 3. Distribute material so there are no large accumulations of either large or small sizes of material.
 - 4. Cut off any projecting reinforcing steel from broken concrete.

END OF SECTION

**SECTION 32 14 50
FLEXIBLE CONCRETE MAT**

PART 1 - GENERAL

1.1. SECTION INCLUDES

- A. Flexamat Standard

1.2. GENERAL DESCRIPTION

- A. A Tied Concrete Block Mat with Doubled Layered Underlayment. This work shall consist of furnishing and placing the system in accordance with this specification and conforming with the lines, grades, design, and dimensions shown on the plans.

PART 2 - PRODUCTS

2.1. MANUFACTURER AND PROPERTIES

- A. Tied Concrete Block Mat with Doubled Layered Underlayment shall be Flexamat Standard, manufactured by Motz Enterprises, Inc.
- B. **Blocks.** Furnish blocks manufactured with concrete conforming to the cement requirements of ASTM C150 and to the aggregate requirements of ASTM C33. Blocks shall have a minimum weight of 3 lb. per block and placed no further than 2 in. apart. Material weight per square foot shall not exceed 10 lbs. Blocks shall have a 2.25" profile, a flat-top pyramid shape, and a coarse finish without protrusions. Concrete shall have a minimum compressive strength requirement of Table1 and certified by a third party.

Table 1: Concrete Compressive Strength Requirements	
Age	Required Compressive Strength psi
7-Day	5000 psi
14-Day	6000 psi
28-Day	6900 psi

- C. **Polypropylene Bi-Axial Geogrid.** The interlocking geogrid shall be an open knitted fabric composed of high tenacity, multifilament polypropylene yarns knitted and coated in tension with an acrylic based coating which is designed to resist degradation in environments with exposure to water and low pH (,4 pH) and high pH (>9 pH). When combined with the revetment mat, this will yield a high tenacity, low elongating, and continuous filament polypropylene geogrid that is embedded within the base of the concrete blocks. Ensure the geogrid meets the requirements of Table 2.

Table 2 Polypropylene Bi-Axial Geogrid			
Property	Unit	Test	Requirement
Mass/Unit Area	oz/yd ²	ASTM D5261	6.5 oz/yd ²
Aperture Size	English units	Measured	1.4x 1.4 inch
Ultimate Wide Width Tensile Strength (MD x CMD)	lb/ft	ASTM D6637	2,055 lb/ft

Elongation at Ultimate Tensile Strength (MD x CMD)	%	ASTM D6637	6%
Wide Width Tensile Strength @ 2% (MD x CMD)	lb/ft	ASTM D6637	822 lb/ft
Wide Width Tensile Strength @ 5% (MD x CMD)	lb/ft	ASTM D6637	1,640 lb/ft
Tensile Modulus @ 2% (MD x CMD)	lb/ft	ASTM D6637	41,100 lb/ft
Tensile Modulus @ 5% (MD x CMD)	lb/ft	ASTM D6637	32,800 lb/ft

- D. **Underlayment Materials.** Flexamat Standard is a three-layered system, includes, in order from top to bottom:
1. Concrete block mat
 2. 5-Pick Leno Weave and
 3. Curlex® II.
- E. The underlayment materials shall be packaged within the roll of the Flexamat Standard.
- F. Five-Pick Leno Weave: This Five-Pick Weave provides added strength and support to the underlayments.

Index Property	Units	Value
GSM	g/m ²	118 (-3 +3)
Density	Picks/10cm	62 x 24 (+/- 2)
Warp Strength	N/5cm	>350
Warp Elongation	%	20 - 50
Weft Strength	N/5cm	> 280
Weft Elongation	%	20 - 50
Warp Shrinkage	%	< 7
Weft Shrinkage	%	< 9

- G. **Curlex® II:** Curlex II erosion control blanket (ECB) consists of a specific cut of naturally seed free Great Lakes Aspen curled wood excelsior with 80% six-inch fibers or greater fiber length. It is of consistent thickness with fibers evenly distributed throughout the entire area of the blanket. The top and bottom of each blanket is covered with degradable polypropylene netting.

Index Property	Test Method	Value
Thickness	ASTM D 6525	0.418 in (10.62 mm)
Light Penetration	ASTM D 6567	34.6%
Resiliency	ASTM D 6524	64%
Mass per Unit Area	ASTM D 6475	0.57 lb/yd ² (309 g/m ²)
MD-Tensile Strength Max.	ASTM D 6818	127.0 lb/ft (1.9 kN/m)
TD-Tensile Strength Max.	ASTM D 6818	50.9 lb/ft (0.7 kN/m)
MD-Elongation	ASTM D 6818	28.64%
TD-Elongation	ASTM D 6818	29.84%
Swell	ECTC Procedure	89%
Water Absorption	ASTM D 1117/ECTC	199%

Bench-Scale Rain Splash	ECTC Method 2	SLR = 6.84 @ 2 in/hr ^{2,3}
Bench-Scale Rain Splash	ECTC Method 2	SLR = 7.19 @ 4 in/hr ^{2,3}
Bench-Scale Rain Splash	ECTC Method 2	SLR = 7.56 @ 6 in/hr ^{2,3}
Bench-Scale Shear	ECTC Method 3	2.6 lb/ft ² @ 0.5 in soil loss ³
Germination Improvement	ECTC Method 4	645%
¹ Weight is based on a dry fiber weight basis at time of manufacture. Baseline moisture content of Great Lakes Aspen excelsior is 22%		
² SLR is the Soil Loss Ratio, as reported by NTPEP/AASHTO.		
³ Bench-scale index values should not be used for design purposes		

2.2. SUBSTITUTIONS

- A. Substitution requests will be considered in accordance with the requirements of Section 01 60 00
- B. Substituted products must meet or exceed the performance testing attributes of the specified product:
 - 1. Full-Scale laboratory testing performed by an independent 3rd party testing facility with associated engineered calculations certifying the hydraulic capacity of the proposed Tied-Concrete Block Erosion Control Mat meets the following requirements:

Test	Tested Value	Bed Slope	Soil Classification	Limiting Value
ASTM 6460	Shear Stress	30%	Sandy Loam (USDA)	24 lb/ft ²
ASTM 6460	Velocity	20%	Loam (USDA)	30 ft/sec

PART 3 - EXECUTION

3.1. EQUIPMENT

- A. Provide the proper equipment to place the mat that will not damage the mat material or disturb the soil subgrade and seed bed

3.2. CONSTRUCTION

- A. Prior to installing Flexamat Standard, prepare the subgrade as detailed in the plans. All subgrade surfaces to be smooth and free of all rocks, stones, sticks, roots, and other protrusions or debris of any kind that would result in an individual block being raised more than 3/4 in. above the adjoining blocks. When seeding is shown on the plans, provide subgrade material that can sustain growth.
- B. Ensure the prepared subgrade provides a smooth, firm, and unyielding foundation for the mats. The subgrade shall be graded into a parabolic or trapezoidal shape to concentrate flow to middle of mat or mats.
- C. When vegetation is required, distribute seed on the prepared topsoil subgrade before installation of the concrete mats in accordance with the specifications.

- D. Install mats to the line and grade shown on the plans and per the manufacturer's guidelines. The manufacturer or authorized representative will provide technical assistance during preparation and installation of the concrete block mats as needed.
- E. Provide a minimum 18 in. deep concrete mat embedment toe trench at all edges exposed to concentrated flows. Recess exterior edges subject to sheet flow a minimum of 6 in.
- F. Provide fastening or anchoring as recommended by the manufacturer or engineer for the site conditions.

3.3. DELIVERY

- A. Mats will be rolled for shipment. Upon delivery, rolls may be left exposed for up to 30 days. If exposure will exceed 30 days, cover or tarp the rolls to minimize UV exposure.
- B. Chipping or missing concrete resulting in a weight loss exceeding 15% of the average weight of a concrete unit is grounds for rejection by the engineer. Replace, repair or patch the damaged areas per the manufacturer's recommendations.

END OF SECTION

SECTION 32 15 00
AGGREGATE SURFACING

PART 1 - GENERAL

1.1. SECTION INCLUDES

- A. Aggregate surfacing.

1.2. REFERENCES

- A. State Standard Specifications, latest revision.

1.3. UNIT PRICES - MEASUREMENT AND PAYMENT

- A. Removing, Salvaging and Reinstalling Existing Gravel/Rock Surfacing: The removing, salvaging and reinstalling of the existing gravel and rock surfacing on existing private driveways, parking lot/areas, streets, roads or alleys will not be measured and paid for separately but shall be considered subsidiary to the cost of those items for which direct measurement and payment are made.
- B. New Aggregate Surfacing: The measurement and payment for furnishing and installing aggregate surfacing on existing private driveways, parking lot/areas, streets, roads or alleys, as shown in the plans or as directed by Owner through Engineer, will be made based on the tons of material delivered and placed. Contractor shall provide weigh scale tickets to Owner through Engineer for all aggregate that is delivered and placed to resurface areas as shown in the plans or as directed by Owner through Engineer. Contractor's unit price for aggregate surfacing shall include furnishing, delivering and spreading aggregate on an approved roadbed surface and includes furnishing the necessary material, labor, equipment, tools and incidentals necessary to complete the work.

1.4. QUALITY ASSURANCE

- A. Aggregate surfacing shall meet the specifications in the Standard Specifications, for gravel and crushed rock surfacing.
- B. Submit a recent analysis from proposed aggregate source showing compliance with the specifications.

PART 2 - PRODUCTS

2.1. ROAD GRAVEL SURFACING

- A. State of Nebraska gravel gradations:

Gravel Surfacing Gradation Limits

Sieve Size	Percent Passing Target Value
1 inch	100
No. 4	78
No. 10	16
No. 200	3

2.2. CRUSHED ROCK SURFACING (ROADS, DRIVEWAYS, PARKING AREAS, TEMPORARY SURFACING)

A. State of Nebraska crushed rock surfacing gradations:

3/4" Crushed Rock for Surfacing Gradation Limits	
Sieve Size	Percent Passing
1 inch	100
No. 4	20-60
No. 10	0-30
No. 200	0-10

1-1/2" Crushed Rock for Surfacing Gradation Limits	
Sieve Size	Percent Passing
1"	100
3/4"	65-95
3/8"	30-70

No. 10	10-30
No. 200	0-10

PART 3 - EXECUTION

3.1. INSPECTION

- A. Verify compacted subgrade is dry and ready to receive work of this section.
- B. Verify gradients and elevations of subgrade are correct.
- C. Beginning of installation means acceptance of existing conditions.

3.2. PLACING AGGREGATE SURFACING

- A. Spread material over prepared subgrade to a total compacted thickness as shown in the plans or as specified in Section 01 10 00 - Special Provisions.
- B. Level surfaces to elevations and gradients indicated.
- C. Compact placed aggregate materials by rolling.
- D. Perform hand tamping in areas inaccessible to compaction equipment.
- E. Add moisture as needed to supplement the compaction process.

END OF SECTION

SECTION 32 92 19**SEEDING****PART 1 - GENERAL****1.1. SECTION INCLUDES**

- A. Preparation of seedbed.
- B. Fine grading topsoil.
- C. Seeding, mulching.
- D. Hydroseeding.
- E. Maintenance.

1.2. SUBMITTALS

- A. Submit from an established seed dealer or grower the certified "blue tag" for each container of seed. This tag will show percentage by weight, percentage of purity, germination and weed seed for each grass, legume and cereal crop stating botanical and common name of each species as specified.

1.3. REGULATORY REQUIREMENTS

- A. Comply with regulatory agencies for material recommendations or regulations.

1.4. MAINTENANCE

- A. Maintain seeded areas immediately after placement until grass/seed mix is well established and exhibits a vigorous growing condition.
- B. Fill washouts and areas of erosion with topsoil. Contractor is responsible for any and all erosion control measures necessary for the establishment of the specified seed material.
- C. Maintain erosion control.

1.5. UNIT PRICE - MEASUREMENT AND PAYMENT

- A. The work of seeding shall be a per acre, lump sum or as shown on the Bid Form for surfaces seeded in accordance with these specifications. The quantity of completed and accepted work measured as provided herein shall be paid for at the contract price for the item "seeding". This price shall be full compensation for furnishing and applying fertilizer; furnishing and sowing seed; furnishing and applying mulch materials; preparation of the seedbed; and for all materials, labor, equipment, tools and incidentals necessary to complete the work.

PART 2 - PRODUCTS**2.1. FERTILIZER**

- A. Fertilizer shall be a standard commercial inorganic product containing nitrogen, available phosphoric acid and soluble potash in a recognized plant food form. This fertilizer shall be either suspendable or soluble in water.
- B. All fertilizer shall comply with the provisions of the State and Local Regulations, with subsequent amendments or revisions thereto. Under these regulations, each brand and grade of commercial fertilizer must be registered. Each container of commercial fertilizer shall have placed on or affixed to the container, in written or printed form, the new weight and the following additional information:
 - 1. The name and address of the person guaranteeing the fertilizing.
 - 2. The brand and grade.
 - 3. The guaranteed analysis showing the minimum percentage of plant food claimed in the following order and form:
 - a. Total nitrogen - percent.
 - b. Available phosphoric acid (P₂O₅) - percent.
 - c. Soluble potash (K₂O) - percent.
 - d. If distributed in bulk, a written or printed statement of the weight and preceding information shall accompany delivery and be supplied to Engineer.
- C. Any grade or mixture of grades of nitrogen and phosphoric acid fertilizer may be used providing the proportions of the minimum rate of application per acre in accordance with the specifications or as directed by Engineer are met.
- D. Fertilizer shall be furnished and delivered in standard bags or bulk.
- E. Rate of application of commercial inorganic fertilizer shall be 200 pounds/acre of 18-46-0, recommended by seed supplier or shown in Section 01 10 00 – Special Provisions.

2.2. SEED MIXTURE

- A. All seeds shall comply with applicable state and federal seed laws.
- B. The seed shall comply with the specified requirements and shall be applied at the rate shown. All seeds shall be certified blue tag. A certified blue tag and analysis tag shall be on every bag.
- C. See Section 01 10 00 – Special Provisions for seed mixture.

2.3. WATER

- A. Clean, fresh and free of substances or matter which could inhibit vigorous growth of grass.

PART 3 - EXECUTION**3.1. EXAMINATION**

- A. Verify that the prepared soil base is ready to receive the work of this section.
- B. Contractor shall notify Engineer at least 48 hours in advance of the intended time to begin work and shall not proceed with such work until permission to do so has been granted by Engineer.

3.2. PREPARATION

- A. Prepare subgrade and topsoil in accordance with Section 31 22 00 – Grading.
- B. Remove foreign materials, plants, roots, stones and debris from site. Do not bury foreign material.
- C. Remove contaminated soil.
- D. The finish grading must be approved by Engineer before seeding operations begin.

3.3. FERTILIZING

- A. Apply fertilizer at the rate specified.
- B. Apply after smooth raking of topsoil and prior to roller compaction.
- C. Do not apply fertilizer at the same time or with the same machine as will be used to apply seed.
- D. Mix thoroughly into upper 2 inches of topsoil.
- E. Lightly water to aid the dissipation of fertilizer, if required.

3.4. SEEDING

- A. The seedbed shall be prepared by loosening the soil to a depth of not less than 2 inches by discing, harrowing, raking or by other approved means. Several discings, harrowings or similar means may be required to provide a satisfactory seedbed. Discing, harrowing and raking shall be longitudinal on all slopes.
- B. Existing weed stubble and small weeds shall be cut and partially incorporated into the soil during the seedbed preparation work. All other growth of vegetation that will interfere with seeding operations shall be removed. Extreme care shall be exercised to avoid injury to trees and shrubs that have not been designated by Engineer to be removed.
- C. For seeding, approved mechanical power-drawn drills shall be used. Mechanical power-drawn drills shall have depth bands set to maintain a planting depth of 1/2 to 1 inch.
- D. Apply seed at the rate specified evenly in 2 intersecting directions. Rake in lightly.
- E. Planting Season: Seeding operations shall be performed only during the periods March 1 to June 30 and August 1 to December 1.

- F. Do not sow immediately following rain, when ground is too dry or frozen, or during windy periods.
- G. Apply water with fine spray immediately after each area has been sown.

3.5. HYDROSEEDING

- A. Apply seeded slurry with a hydraulic seeder, only when specifically stated in the Section 01 10 00 – Special Provisions, evenly in 2 intersecting directions at a rate of 1,500 pounds of mulch/acre.

3.6. MULCHING

- A. This work shall consist of placing a mulch on areas seeded. The mulch shall be loose enough to allow sunlight to penetrate and air to slowly circulate, but thick enough to shade the ground, reduce rate of water evaporation and prevent or reduce water or wind erosion.
- B. Mulch shall be either dry cured native hay or threshed grain straw. Hay or straw shall be free from seeds of noxious weeds and relatively free from seeds of all other weeds.
- C. The mulch shall be applied at the rate of 2 tons per acre.
- D. Mulch shall be immediately applied after sowing the seed unless otherwise directed by Engineer. The mulch shall be applied with a mulch blowing machine or other approved methods.
- E. Immediately following the spreading of the mulch, the material shall be anchored to the soil by a V-type wheel land packer, a soil erosion mulch tiller or other suitable equipment which will secure the mulch firmly to form a soil-binding mulch.
- F. Apply water with a fine spray immediately after each area has been mulched.

3.7. RESEEDING

- A. Prior to the expiration of the 1-year warranty, Contractor will be required to reseed any area that has not established a vigorous growth of specified seed mixture. Engineer to determine which areas are to be reseeded.

END OF SECTION

33 40 00**STORM DRAINAGE UTILITIES****PART 1 - PART 1 - GENERAL****1.01 SECTION INCLUDES**

- A. Storm drainage piping, fittings and accessories.
- B. Connection of drainage system to existing storm sewer system or open channel.
- C. Manholes, junction boxes, grate inlets, perforated risers, curb inlets, drop curb inlets and area inlets.

1.2. REFERENCES

- A. AASHTO M 36 – Standard Specification for Corrugated Steel Pipe, Metallic-Coated, for Sewers and Drains; American Association of State Highway and Transportation Officials.
- F. AASHTO M 232 – Standard Specification for Zinc Coating (Hot-Dip) On Iron and Steel Hardware.
- G. AASHTO M 298 – Standard Specification for Coatings of Zinc Mechanically Deposited on Steel.
- H. AASHTO M 294 – Standard Specification for Corrugated Polyethylene Pipe, 300- to 1500- mm (12- to 60-in.) Diameter.
- M. ASTM A 929 – Standard Specification for Steel Sheet, Metallic-Coated by the Hot-Dip Process for Corrugated Steel Pipe.
- N. ASTM D 698 – Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft³).
- O. ASTM D 1056 – Standard Specification for Flexible Cellular Materials—Sponge or Expanded Rubber.
- P. ASTM D 1556 – Standard Test Method for Density and Unit Weight of Soil in Place by Sand-Cone Method.
- Q. ASTM D 1557 – Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft³ (2,700 kN-m/m³)).
- R. ASTM D 1785 – Standard Specification for Poly (Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120.
- S. ASTM D 2167 – Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method.
- T. ASTM D 2321 – Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity – Flow Applications.

- U. ASTM D 2729 – Standard Specification for Poly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings.
- W. ASTM D 6938 – Test Methods for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth).
- X. ASTM D 3034 – Standard Specification for Type PSM Poly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings.
- Y. ASTM F 679 – Standard Specification for Poly (Vinyl Chloride) (PVC) Large Diameter Plastic Gravity Sewer Pipe and Fittings.
- Z. ASTM F 794 – Specification for Poly (Vinyl Chloride) (PVC) Profile Gravity Sewer Pipe and Fittings Based on Controlled Inside Diameter.
- AA.AA.ASTM F 894 – Specification for Polyethylene (PE) Large Diameter Profile Wall Sewer and Drains Pipe.
- BB.BB.ASTM F 949 – Specification for Poly (Vinyl Chloride) (PVC) Corrugated Sewer Pipe with a Smooth Interior and Fittings.

1.3. UNIT PRICES

A. Pipe:

1. Method of Measurement:

- a. Measured along centerline of pipe, to the nearest foot.
- b. No deduction for junction boxes/manholes or fittings installed in the line.

2. Pay Unit: By the linear foot (LF) for each respective size and type of pipe.

- a. Includes excavation, hand trimming excavation, pipe, placement, assembly, bedding, backfilling and compaction of backfill, testing and incidentals thereto.
- b. Testing may include:
 - i. Alignment testing of pipe.
 - ii. Compacted density testing of backfill.
 - iii. Televising inspection.

B. Special Pipe Fittings (Elbows, Bends, Flared End Sections):

- 1. Method of Measurement and Pay Unit: By the unit, Each, for at the contract unit price for the various sizes in the accepted work.
- 2. Includes hand trimming excavation, bedding, backfilling, connection to pipe and incidentals thereto.

C. Connection to Existing Storm Drainage Pipe or Junction:

- 1. Method of Measurement and Pay Unit: By the unit, Each.

2. Includes excavation, hand trimming excavation, bedding, backfilling and compaction of backfill, adapters, fittings, thrust restraints, couplings, coring the wall of the structure, sleeves, gaskets and incidentals thereto.

D. Dewatering of Trench:

1. Dewatering, including intercepting and diverting site drainage and surface water flows away from excavations and trenches, and removing standing water from trench or excavation with a sump and pump shall be considered incidental and subsidiary to other items of work for which direct payment is made.
2. Includes providing all permits required for the dewatering and paying all permit costs, pump, piping, wells and/or well points, dewatering equipment, assembly and disassembly, backfilling and compaction of backfill, energy cost and incidentals thereto.

E. Erosion Control Measures:

1. Method of Measurement and Payment: Subsidiary to items in which direct payment is made.
2. Erosion control measures include before, during and after construction.

F. TV Inspection:

1. Considered to be a subsidiary item included in the cost of the item for which payment is made.

1.4. DEFINITIONS

- A. Bedding: Fill placed under, beside and directly over pipe prior to subsequent backfill operations.

1.5. SUBMITTALS

- A. Product Data: Provide data indicating pipe and pipe accessories.
- B. Manufacturer's Installation Instructions: Indicate special procedures required to install products specified.
- C. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- D. Project Record Documents:
1. Record location of pipe runs, connections and invert elevations.
 2. Identify and describe unexpected variations to subsoil conditions or discovery of uncharted utilities.

PART 2 - PART 2 - PRODUCTS

2.1. PIPE FOR CULVERTS AND STORM DRAINS

- B. Corrugated Metal Pipe (CMP):

1. Corrugated Steel Pipe, Pipe Arches and Underdrains:
 - a. Conform to AASHTO M36, Type I, or ASTM A 929 steel circular section with annular or helical corrugations.
 - b. Zinc-coated steel or aluminum-coated steel materials shall not be mixed in any installation.
 - c. Bolts, nuts, washers and other hardware used with coupling bands galvanized AASHTO M232 or mechanically galvanized AASHTO M298, Class 50.
 - d. Minimum Gauge or Sheet Thickness for Steel Culverts: Nominal Diameter
Sheet Thickness

<u>(Inches)</u>	<u>Gauge (Inches)</u>
8 thru 24	16 (0.057)
30 thru 36	14 (0.072)
42 thru 54	12 (0.101)
60 thru 72	10 (0.129)
Over 72	8 (0.168)

2. Connecting Bands: Connecting bands shall be of the type, size and sheet thickness of band, and the size of angles, bolts, rods and lugs as indicated or where not indicated as specified in the applicable standards or specifications for the pipe. Exterior rivet heads in the longitudinal seam under the connecting band shall be countersunk or the rivets shall be omitted and the seam welded. Connecting bands with annular or helical corrugations to match pipe ends.

C. Plastic Pipe:

1. Polyvinyl Chloride (PVC):
 - a. PVC plastic meeting ASTM D1784, minimum cell class 12454-B.
 - b. Minimum pipe stiffness of 46 psi.
 - c. Integral bell and spigot joints with elastomeric seals according to ASTM D 3212 and ASTM F 477.
 - d. Solid/Smooth Wall PVC Pipe
 - i. Conform to ASTM D 3034 and ASTM F 679.
 - ii. Thickness/Rating: SDR 35, minimum.
 - e. Profile PVC Pipe
 - i. Smooth interior and ribbed exterior.
 - ii. Conform to ASTM F 794, Series 46.
 - f. Corrugated PVC Pipe

- i. Smooth interior and corrugated exterior.
 - ii. Conform to ASTM F 949.
 - g. Composite Pipe
 - i. Conform to ASTM D 2680.
- 2. High Density Polyethylene Pipe (HDPE) and Fittings:
 - a. Conform to AASHTO M294, Type S, corrugated exterior and smooth interior.
 - b. HDPE material meeting ASTM D 3350, minimum cell class 335420 C.
 - c. Minimum pipe stiffness at 5% deflection according to ASTM D 2412.
 - d. Integral bell and spigot joints with elastomeric seals complying with ASTM F 477.
 - e. Corrugated HDPE Pipe
 - i. Conform to AASHTO M252 and M294, Type C or S.
 - ii. Pipe shall be produced from PE certified by the resin producer as meeting the requirements of ASTM D 3350, minimum cell class 335420C.
 - f. Profile Wall HDPE Pipe
 - i. Conform to AASHTO F 894.
 - ii. Pipe shall be produced from PE certified by the resin producer as meeting the requirements of ASTM D 3350, minimum cell class 335434C.
 - g. Closed-Cell Synthetic Expanded Rubber Gaskets: ASTM D 1056, Grade 2A2.

2.2. PIPE ACCESSORIES

- A. Fittings: Same material as pipe molded or formed to suit pipe size and joint design.
- B. Concrete Flared-End Sections:
 - 1. AASHTO M170, Class III.
 - 2. AASHTO M206, Class A-III.
 - 3. AASHTO M207, Class HE-III.
- C. Metal Flared-End Sections:
 - 1. Steel Flared-End Sections: AASHTO M36 or ASTM A 929. Galvanized bolts, nuts, washers and other hardware items used with coupling bands, AASHTO M232 or mechanically galvanized, AASHTO M298, Class 50.
 - 2. Minimum gauge or sheet thickness for steel flared-end sections same as pipe culverts.

2.4. MORTAR

- A. Mortar for pipe joints, connections to other drainage structures, and block construction shall conform to the requirements of ASTM C 270.
 - 1. Type S or M
 - 2. 28 day Compressive Strength: 1,800 psi, minimum
 - 3. Mix Proportions: 1 part mortar to 2-1/4 to 3 parts sand
 - 4. Water Retention: 75%, minimum

2.5. BEDDING

- A. The bedding surface for the pipe shall provide a firm foundation of uniform density throughout the entire length of the pipe.
- B. Concrete Pipe Requirements: When no bedding class is specified or detailed on the Drawings, concrete pipe shall be bedded in granular material minimum 4 inch in depth in trenches with soil foundation. Depth of granular bedding in trenches with rock foundation shall be 1/2 inch in depth per foot of depth of fill, minimum depth of bedding shall be 8 inch up to maximum depth of 24 inches. The middle third of the granular bedding shall be loosely placed. Bell holes and depressions for joints shall be removed and formed so entire barrel of pipe is uniformly supported. The bell hole and depressions for the joints shall be not more than the length, depth, and width required for properly making the particular type of joint.
- C. Corrugated Metal Pipe Requirements: When no bedding class is specified or detailed on the Drawings, bedding for corrugated metal pipe and pipe arch shall be in accordance with ASTM A 798. It is not required to shape the bedding to the pipe geometry. However, for pipe arches, either shape the bedding to the relatively flat bottom arc or fine grade the foundation to a shallow v-shape.
- D. Plastic Pipe Requirements: When no bedding class is specified or detailed on the Drawings, bedding for PVC, PE, SRPE and PP pipe shall meet the requirements of ASTM D 2321 and manufacturer's recommendations. Use Class IB or II material for bedding, haunching, and initial backfill. Use Class I, II, or III material for PP pipe bedding, haunching and initial backfill.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Verify measurements at site; make necessary field measurements to accurately determine pipe makeup lengths or closures.
- B. Examine site conditions to ensure construction operations do not pose hazards to adjacent structures or facilities.

3.2. TRENCHING

- A. Refer to Section 31 23 33 – Trenching for Utilities.

3.3. INSTALLATION - PIPE

- A. Verify that trench excavation cut is ready to receive work and excavation dimensions and elevations are as indicated in the Drawings.
- B. Install pipe, fittings and accessories in accordance with manufacturer's instructions.
- C. Seal joints soil-tight.
- D. Install piping system beginning at low point, true to grades and alignment indicated with unbroken continuity of invert. Place bell ends of piping facing upstream. Install gaskets, seals, sleeves, and couplings according to manufacturer's written instructions.
- E. Lay pipe to slope gradients noted in the Drawings.
- F. The open end of the pipes shall be protected at all times against the entrance of earth or other foreign material.
- G. Pipe shall not be laid in water, and pipe shall not be laid when trench conditions or weather are unsuitable for such work. Diversion of drainage or dewatering of trenches during construction shall be provided as necessary.
- I. Connect to storm sewer system or open channel.
- J. Install erosion and silt control measures to keep pipe free from silt.

3.5. PROTECTION

- A. Protect pipe and bedding cover from damage or displacement until backfilling operation is in progress.
- B. Protect pipe and drainage structures from the entry of silt. Contractor to install appropriate erosion control and silt control measures during and after construction. Contractor to remove any accumulated silt prior to the acceptance of the project.

3.6. PIPING ALIGNMENT TOLERANCE

- A. Apply the following tolerances for piping installed by open trench construction or installed inside a casing pipe.
- B. General alignment shall be checked using televised inspection of all gravity mains greater than 20 linear feet, and must be completed prior to paving.
- C. Maximum allowable horizontal and vertical alignment variance from design line and grade shall be the greater of:
 - 1. +/- 5% of the inside diameter of the pipe
 - 2. +/- 1/2 inch.
- D. Maximum allowable reverse slope (sag) in gravity main shall be that which causes a standing water depth of 1" or 10% of the inside diameter of the pipe, whichever is greater, at any point along the line.
- E. Remove and reinstall pipe to proper grade where there is standing water greater than the maximum allowable depth.

- F. Sags shall only be allowed where entering and exiting grades are adequate to provide a velocity of 2 feet per second or more.

3.7. CLEANING STORM DRAINAGE PIPES

- A. Plug downstream manholes.
- B. Flush and clean drainage lines and manholes prior to testing.
- C. Remove debris at junctions and manholes.
- D. Do not allow debris to enter existing drainage system.

END OF SECTION

