Spring Creek Prairie Audubon Center

New Maintenance Building 2021

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INVITATION TO BID

INVITATION NO.: 2021-2.01 NEW MAINTENANCE BUILDING 2021

1. INVITATION

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

Project Name: New Maintenance Building 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: October 22, 2021 - 4:00 p.m.

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

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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 **April 1, 2022**.

END OF SECTION

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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: New Maintenance Building 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:

Total Bid Amount in Words:_____Dollars

Total Bid Amount in Figures: $_____

Bid Breakdown	**Price**
Concrete Pad, East Driveway	
Concrete Pad, West Driveway	
Interior conditioned space framing, including stairs and mezzanine	
Finishes (drywall, base cove, paint) in conditioned space	
Finishes (drywall, wall paneling, caulking) outside conditioned space	
Railing on Mezzanine	
All work not specifically listed elsewhere in this Bid Breakdown	

□ COMPLETE THE FOLLOWING INFORMATION – ADDITIVE ALTERNATE:
The Owner may choose to award additional work based on the bids received and funds available. Bidder agrees to furnish all labor, materials, tools, equipment, services, transportation required to complete the work defined below:

Additive Alternate #1: Insulate the entire metal building package with minimum R13 fiberglass batt insulation. Use the building manufacturer's standard fastening system and interior sheet plastic covering.

In determining this bid amount, be sure to avoid duplicating the cost of the exterior insulated wall section adjacent to the conditioned space which is shown on the drawings. The cost of this alternate should be the net addition to the base bid after subtracting the partially insulated exterior wall, and adding insulation to the ceiling and all exterior walls.

Provide the Bid amount for Additive Alternate #1 here in figures: $_____

□ 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. _____, (list all received) 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 date of the Notice to Proceed. (Bidder to enter number of days.) For the purpose of this estimate, Bidder may assume an NTP will be provided within 21 calendar days of the bid closing date. If this NTP date assumption is not met, the Bidder must notify the Owner of potential schedule changes as practical after such changes are known.

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 **New Maintenance Building 2021**, pursuant to the terms and conditions set forth in the contract documents dated **October 4, 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)

CONSTRUCTION SERVICES CONTRACT

THIS CONSTRUCTION SERVICES CONTRACT (this "Contract"), dated as of the [Day] day of [Month], 20__, is made by and between [Contractor] ("Contractor" or "IC"), having its office located at [Address], and National Audubon Society, Inc. ("Owner"), having an address at 225 Varick St., New York, NY 10014, through its local office 11700 SW 100th St, Denton, NE 68339. This document, together with the General Terms and Conditions for purposes of this Contract, and any exhibits, riders, and annexes attached hereto or referenced herein, all of which follow hereto and are attached and incorporated by reference in this Contract, and any amendments entered into from time to time hereafter, constitute the entire agreement between the parties.

In consideration of [Contract Sum], as set forth in Contractor's Contract Sum Breakdown Worksheet attached hereto and made a part hereof as Exhibit A-1, and the mutual covenants and agreements hereinafter set forth, and of other good and valuable consideration, the receipt and sufficiency of which are hereby mutually acknowledged, the parties hereto, intending to be legally bound, agree as follows:

(1) The project shall consist of the complete New Maintenance Building 2021, as more particularly described in the Contractor's Proposal, dated [date], attached hereto and made a part hereof as Exhibit A-2, per the architectural plans and specifications, attached hereto and made a part hereof as Exhibit A-3 (collectively, Exhibit A, the "Project").

(2) This Contract includes any Work performed in connection with the Project prior to the date of this Contract. The term "Work" means the construction and services required by the Contract Documents, whether completed or partially completed, and includes all other labor, materials, supplies, equipment and services provided or to be provided by Contractor and any Subcontractors retained by Contractor to complete the Work and to fulfill Contractor's obligations in connection with the Project. For purposes of this Contract, the term "Contractor" shall also any Subcontractors performing Work at the Contractor's direction or under its supervision or control. The Work may constitute the whole or a part of the Project.

(3) The Project is located at 11700 SW 100th St, Denton, NE 68339 (the "Site").

(4) The Work shall commence no later than [Date of Commencement] ("Date of Commencement"). Subject to the terms and conditions of this paragraph, the "Date of Substantial Completion" shall be [Date of Substantial Completion] and the "Date of Final Completion" shall be no later than twenty (20) days after the Date of Substantial Completion, unless the parties enter into a separate, written agreement agreeing to an extension of time and dates by which Contractor must reach Substantial Completion and/or Final Completion and setting forth the specified purpose or reason for the extension of time and dates. The term "Substantial Completion" or "Substantially Complete" means that the Work, or designated portion thereof, is sufficiently complete, subject to completion of the Work contained in the Punch List, in accordance with the Contract Documents so that Owner can occupy and utilize the Work for Owner's intended purpose. The term "Punch List" means a list of minor, uncompleted, or unacceptable items of Work that do not interfere with the use and occupancy of any part of the Project for its intended purpose. The term "day" means calendar day unless specifically denoted otherwise.

(5) The "Contract Documents" shall consist of this Contract and its attached Exhibits (including any written modifications to the Contractor's Proposal accepted by Owner), the approved Construction Documents (excluding Shop Drawings submitted by the Contractor) Performance Specification, if any, by the architect of the Project, and the General Terms and Conditions which follow hereto and are annexed and incorporated heretofore, all of which are incorporated into this Contract by reference and any Modifications issued after execution of this Contract. The terms "Construction Documents" are further defined in Article 1 of the General Terms and Conditions attached hereto and made a part hereof.

(6) The Contract Documents can only be amended or modified by a Modification. A "Modification" is a (i) written amendment to the Contract Documents signed by both parties, or (ii) a Change Order (as defined in Section 4.1 of the General Terms and Conditions). The Contract Documents shall not be construed to create a contractual relationship of any kind between any persons or entities other than Owner and Contractor, including but not limited to any Subcontractors or materialmen retained by Contractor to complete the Work.

(7) The term "Contract Time" shall mean the period of time allotted from the Date of Commencement to the Date of Substantial Completion for the performance of and completion of the Project in accordance with the Contract Documents for the Contract Sum.

(8) Contractor shall fully execute the Work described in the Contract Documents, including but not exclusive to the description of the major components of the Property as set forth in Contractor's Contract Sum Breakdown Worksheet dated [Date] annexed hereto and made a part hereof as Exhibit A-1, except to the extent specifically indicated in the Contract Documents to be the responsibility of others. Contractor represents that the scope of work, set forth in Contractor's Contract Sum Breakdown Worksheet dated [Date], are representative of the major components of the Work to be completed, but covenants that it is not intended to be, nor shall be, exclusive and exhaustive description of Contractor's obligations and scope of work to be executed by Contractor to complete the Work.

(9) Contractor represents that it is fully licensed as a general contractor, and its Subcontractors working on the Project are fully licensed in their respective trades, in [County], [State], and all such licenses will be in full force and effect during the duration of the Project.

(10) Contractor's total compensation for performance and completion of the Work and all services (i) in accordance with the Contract Documents and (ii) within the Contract Time shall be stipulated sum equal to _____, as further described and set forth in Contractor's Contract Sum Breakdown Worksheet attached hereto and made a part hereof as Exhibit A-1, (the "Contract Sum"), including all charges for applicable taxes which have been legally enacted on the date of this Contract (whether or not effective or merely scheduled to go into effect), freight, licenses, inspections, permits, and other fees, with progress payments to be made in accordance with the following schedule:

Deposit due upon execution of this letter agreement	$
	$
	$
	$
Upon substantial completion of Work	$
Upon final completion of Work (including punch list)	$
TOTAL COST OF WORK	**$**

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

(11) Contractor shall promptly pay each of its Subcontractors and material suppliers, upon its receipt of payment from Owner, on account of such entities' portion of the Work, and Owner shall have no responsibility therefor.

(12) Before commencing construction activities, Contractor agrees to take all necessary field measurements and verify field conditions with the architectural plans and specifications for the Project and any other information known to Contractor, and report any inconsistencies to Owner and the Architect.

(13) Contractor covenants that it shall closely supervise, coordinate and direct the Work, in accordance with all applicable state and local codes, laws and regulations which governs and has jurisdiction over the Project, using its most professional skill and attention, through its final completion and sign-off by any required inspectors or local authorities, and Owner's acceptance of the Work. The parties agree that Contractor shall be solely responsible for and have control over all construction means, methods, techniques, sequences and procedures, including all Subcontractors.

(14) Contractor agrees that the Cost of the Work shall not be exceeded, notwithstanding any increases in the cost of any Subcontractors, other labor or materials occurring after the date of this agreement, unless Owner makes material changes in the Scope of Work, which shall be agreed to in writing by the parties as a Change Order. Contractor agrees to extend to Owner, at no additional charge, any and the full amount of any other discounts available from any supplier to the Contractor, for appliances, fixtures, plumbing supplies and other materials, although Contractor shall have no responsibility to pay for such materials.

(15) The cost or credit to Owner from a change in the Work shall be determined by mutual agreement of the parties, in accordance with Article 4 of the General Terms and Conditions hereof. The parties agree that, in the event of any Change Order for the Work, the cost to Owner shall be an amount equal to the cost of labor, equipment, materials, Subcontractors' costs for their labor, equipment, materials and fee, plus Contractor's fee, established in accordance with Article 4 of the General Terms and Conditions annexed hereto, in the amount of [percent (__%)]. In the event of a Change Order decreasing the Work, Owner shall be credited with a decrease in the Contract Sum equal to the cost of labor, equipment, materials and applicable general conditions of the Contractor, and Subcontractors' costs for their labor, equipment and materials as mutually agreed by the parties.

(16) Owner's designated representative is Meghan Sittler (collectively, the "Owner's Representative"). All communications relating to the Work and the Project from Contractor shall be conveyed through the Owner's Representative. The Owner's Representative shall be authorized to act on Owner's behalf with respect to the Project.

(17) Contractor's designated representative is [Name of Contractor's Rep] (the "Contractor's Representative"). All communications relating to the Work and the Project from Owner shall be conveyed through the Contractor's Representative. The Contractor's Representative shall be authorized to act on Contractor's behalf with respect to the Project.

(18) Contractor shall procure and maintain, subject to the conditions stated in Article 2 of the General Terms and Conditions and prior to the commencement of the Work, the insurance limits in amounts not less than the following minimum limitations:

	Commercial General Liability Insurance	Excess/ Umbrella Insurance	Comprehensive Automobile Liability Insurance Combined Single Limit Per Occurrence	Employer's Liability Insurance Per Accident, Per Disease, Per Employee	Worker's Compensation

Contractor	$_,000,000 Per Occurrence; $4,000,000 General Aggregate	$_,000,000 Per Occurrence; $2,000,000 General Aggregate	$_,000,000	$_00,000	Statutory
Subcontractors	$_000,000 Per Occurrence; $4,000,000 General Aggregate	$_,000,000	$_,000,000	$_00,000	Statutory

(19) Contractor will promptly provide copies of general liability, workers' compensation and automobile liability insurance certificates evidencing the limits set forth and the naming of Owner's Parties (as defined in Section 2.8 of the General Conditions) as Additional Insured, along with the applicable endorsements thereto, as required and set forth under Article 2 of the General Terms and Conditions, and all required licenses for itself and its Subcontractors for the Project. Contractor agrees that, from the time of Project commencement and for the duration of Project construction, Contractor's insurance and license, and that of its Subcontractors, will be in full force and effect.

(20) Contractor shall be responsible for all damages, claims, and expenses that Owner may incur arising out of (i) Contractor's or any of its Subcontractor's default under this agreement, (ii) Contractor's or any of its Subcontractor's negligence or willful misconduct or that of its Subcontractors, and (iii) all liens or claims of liens for materials, equipment, labor or other costs filed against the Project by Contractor or any of its Subcontractor, provided that Owner has paid Contractor all sums due under this agreement related to such liens or claims of lien, as set forth in Article 3 of the General Terms and Conditions.

(21) This Contract may be executed in counterparts, each of which when so executed and delivered will be considered an original, but all of which will constitute one and the same instrument.

The following Exhibits are incorporated herein by reference and made a part of this Contract (as if originally set forth herein):

Exhibit A-1	Contractor's Contract Sum Breakdown Worksheet;
Exhibit A-2	Contractor's Proposal;
Exhibit A-3	Architectural Plans and Specifications;
Exhibit B	Reserved
Exhibit C	Forms of Final Release, Waiver of Liens and Indemnification.
Exhibit D	Form of Application and Certificate for Payment

IN WITNESS WHEREOF, the parties hereunto have set their hands and seals on the date written.

CONTRACTOR:	OWNER:
[_____]	NATIONAL AUDUBON SOCIETY, INC.
By: _____	By: _____
Name:	Name:
Title:	Title:

GENERAL TERMS AND CONDITIONS

ARTICLE 1 - CONTRACTOR'S SERVICES AND RESPONSIBILITIES.

1.1 **Provisions Related to Contractor's Services**. Contractor, or contractor along with its Subcontractors retained by Contractor to complete the Work, shall furnish all construction services necessary to complete the Work, and shall provide Owner for Owner's review and written acceptance, as may be necessary, construction documents that are of sufficient detail to establish the size, quality, and character of the materials, including final finishes, required for the Project (collectively, "Construction Documents").

(a) Contractor shall also furnish the following services: (i) consulting with Owner to develop the scope of the Project; (ii) reviewing with Owner the criteria required for such development; (iii) consulting with the Owner's consultants, Contractor's employees, Subcontractors, their agents and employees, and any other person or entity required for such development; (iv) carefully studying any material or information provided to Contractor by Owner; (v) taking field measurements of any existing conditions related to the Work; (vi) observing any conditions at the Site affecting the Work; (vii) reviewing and providing comments, if necessary, to construction documents submitted by Owner to Contractor for review with respect to the scope of the Work (collectively, the "Construction Documents") and (vii) providing all supervision, labor, material, equipment, tools, supplies, apparatus, fuel, power, utilities, transportation, shop drawings, samples, electronic data, and all other documents and services necessary to provide, construct, fabricate, install, test and completely finish all of the Work in accordance with the Construction Documents in every respect. The Construction Documents shall provide information for the use of those in the building trades and include all documents required for approval of Governmental Authorities (as defined in Section 1.1(b) of these General Terms and Conditions).

(b) The Work shall be performed (i) in accordance with the best practice of other contractors similarly situated to Contractor performing projects similar in scope and complexity to the Project, (ii) in compliance with the Contract Documents, (iii) in compliance with the terms of any grant agreement funding all or a portion of the Work, and (iv) in compliance with all applicable requirements of all laws, ordinances, codes, rules, regulations, and decisions (collectively, the "Legal Requirements") of all governmental authorities, including all federal, state, county, city, local, and municipal bodies having jurisdiction over Owner, Contractor, Subcontractors, those for whom Contractor is responsible, the Site, the Project, the Work, or any of the foregoing ("Governmental Authorities"), and without use of asbestos, asbestos-containing materials, or other hazardous or toxic materials, substances, or waste (1) as defined from time to time by applicable Legal Requirements, (2) that would cause or pose a material threat, hazard, or risk to human health or safety or to the environment, or (3) that may result in the imposition of, or form the basis for, any claim or damages. The Contractor shall be responsible for the construction of the Work with the Legal Requirements. If Contractor performs Work contrary to the Legal Requirements, Contractor shall assume responsibility for such Work and shall bear the costs attributable to correction. The construction Work shall commence only after Contractor has obtained all applicable permits for the portion of the Work to be done at that time. The Work shall be accomplished to the satisfaction of Owner without material interruption to the facilities or operations of Owner and with a minimum of inconvenience to Owner. Contractor shall report promptly to the Owner any errors, inconsistencies, or omissions discovered in the Work.

(c) For the safety and protection of those on or adjacent to the Site, Contractor shall provide proper and sufficient security to secure the Site and the construction area where Work is being performed. Contractor shall prevent dust, dirt, rubbish, and debris from escaping beyond the construction area where the construction Work is being performed and from being disseminated beyond the Site. Contractor shall keep the Site free from any accumulation of rubbish, debris, and waste. Contractor shall prosecute the Work diligently and provide sufficient labor forces to complete the Work required (including the supply of materials and equipment to the Site) to substantially complete the Project by the Date of Substantial Completion and to complete the Project by the Date of Final Completion. Contractor shall keep the Site and surrounding area free from the accumulation or waste materials or rubbish caused by operations under the Contract. Upon completion of the construction Work, Contractor shall remove from and about the Site waste materials, rubbish, Contractor's and Subcontractors' tools, construction equipment, machinery and surplus materials and shall thoroughly clean all construction Work and leave those portions of the construction Work and Site in which Contractor has been working in a clean and orderly condition. Without limiting the foregoing, any surface that may have become dirty or marred during prosecution of the Work shall be

thoroughly cleaned and/or restored. If Contractor fails to clean up as provide in the Contract Documents, Owner may do so and the cost thereof shall be charged to Contractor.

1.2 **Licenses and Authorizations**. Contractor represents that it and its Subcontractors (as defined in Section 1.4 of these General Terms and Conditions) are fully licensed and registered, as applicable, by the state in which the Site is located and are authorized to perform the Work.

1.3 **No Additional Work**. This Contract shall not create any rights for Contractor for any further phase of the Project, if any, beyond the scope of services set forth in this Contract or for any work on any other project of Owner. Contractor shall not perform any additional work without written authorization from Owner.

1.4 **Subcontractors.** Contractor may contract any portion of its Work to subcontractors upon the prior consent of Owner. The term "Subcontractor" means a person, entity, or organization having a direct contract with Contractor or another contractor to perform a portion of the design or provide labor or to supply material or equipment for the Work, including the engineering firm with overall responsibility for design of the Project, and including any employee, agent, officer, director, partner, member, principal, or representative of any Subcontractor. Owner may require Contractor to replace any such Subcontractor that Owner deems to be unacceptable at any time during the Project.

1.5 **Time of the Essence**. Contractor acknowledges and agrees that time is of the essence with respect to Contractor's performance of this Contract, and that, subject to the terms and conditions of this Contract and these General Terms and Conditions, the Project shall be substantially completed no later than the Date of Substantial Completion, unless the parties enter into a written, separate agreement agreeing to an extension of time and date for Contractor to reach Substantial Completion.

1.6 **Contingent Assignment of Subcontracts**. Contractor assigns, transfers, and grants to Owner all the rights, title, and interests of Contractor in, to, and under each contract that Contractor enters into with a Subcontractor. Upon termination of this Contract by Owner for cause, Owner, in its sole discretion, may accept assignment and may reassign any such contract between Contractor and a Subcontractor to another contractor or any other person or entity of Owner's choosing upon notice to the Subcontractor in writing. Contractor agrees that each contract entered into by Contractor with a Subcontractor shall contain (i) the consent of such Subcontractor to the foregoing assignment, and (ii) the agreement of such Subcontractor that, upon written notice from Owner to Contractor that Owner has exercised its right of assignment under this Contract, such Subcontractor shall continue to perform for the benefit of Owner or Owner's new general contractor the Subcontractor's obligations under the contract between Contractor and the Subcontractor.

1.7 **Documents and Samples at the Site**. Contractor shall maintain at the Site for Owner one record copy of the Construction Documents and Performance Specifications, Change Orders and other Modifications, in good order and marked currently to record field changes and selections made during construction, and one record copy of approved Shop Drawings, Product Data, Samples and similar required submittals. These shall be delivered to Owner upon completion of the Work.

ARTICLE 2 - INSURANCE

2.1 **Contractor's Insurance**. Contractor shall procure and maintain in effect during the term of this Contract the following insurance coverages, which insurance shall be approved by Owner and placed with insurance companies rated A/XII or better by Best's Insurance Key Rating Guide. Such insurance companies shall be lawfully authorized to do business in the jurisdiction in which the Project is located:

2.1.1 **Commercial General Liability**. Commercial General Liability Insurance on an occurrence basis and on the current version of form ISO CG 00 01, including but not limited to, coverage for products/completed operations, premises/operations, contractual and personal advertising injury liabilities, with a cross-liability endorsement, severability of interests clause, and providing coverage for explosion, collapse and underground hazards with combined single limits as set forth in the chart in the main section of this Contract, naming Owner and its designees as additional insureds to provide coverage for their liability arising out of any work of

Contractor on the Project. Completed operations coverage shall continue to be maintained for at least two (2) years following the completion of the Project, naming Owner and its designees as additional insureds during such period of continuation.

2.1.2 **Excess/Umbrella**. Excess/umbrella insurance on an occurrence basis with limits as set forth in the chart in the main section of this Contract.

2.1.3 **Comprehensive Automobile Liability**. Comprehensive Automobile Liability Insurance on an occurrence basis with coverage for all owned, non-owned, and hired vehicles with combined single limits, with limits as set forth in the chart in the main section of this Contract.

2.1.4 **Employer's Liability**. Employer's Liability Insurance with limits as set forth in the chart in the main section of this Contract.

2.1.5 **Workers' Compensation**. Workers' Compensation Insurance providing statutory benefits and limits that shall fully comply with all state and federal requirements applying to this insurance in the state where the Project is located.

2.2 **Subcontractors' Insurance**. In the event that Contractor elects to perform a portion of the Work through the use of Subcontractors, Contractor shall require Subcontractors to comply with all insurance requirements contained in this Contract, including the limits thereof. Contractor shall monitor Subcontractors' insurance certificates for compliance with the insurance provisions of this Contract.

2.3 **Builder's Risk.** Owner may elect to maintain builder's risk insurance during the course of construction. In the event Owner so elects, such insurance will include the perils of fire, extended coverage, vandalism, malicious mischief, accidental collapse, water damage, flood, and earthquake, and will include the interests of Owner, Contractor, and Subcontractors. Owner will not assume responsibility for loss of materials or equipment due to theft, burglary, or mysterious disappearance. Coverage shall not extend to Contractor's or Subcontractors' tools, equipment, scaffolding, or any other property of Contractor or Subcontractors not destined to become part of the Work, and any loss of or damage to such property shall be the Contractor's sole responsibility.

2.4 **Terms and Conditions of Insurance**. Each insurance policy shall provide that it shall not be canceled, allowed to expire or materially changed without at least thirty (30) days' prior written notice to Owner. The Commercial General Liability policy shall provide that Contractor's policy shall be primary to and not contributory to any other valid and collectible insurance that may be available on behalf of Owner. The Contractor may not self-insure without Owner's written permission.

2.5 **Proof of Insurance**. Contractor shall furnish to Owner concurrently with the execution of this Contract, all certificates of insurance, including those of Subcontractors and any materialmen or vendors, in form acceptable to Owner; or, upon the request of Owner, copies of the insurance policies required to be maintained hereunder evidencing that such coverage is in full force and effect. Contractor shall submit to Owner all insurance certificates prior to mobilization and before any Work will be allowed to commence on Site.

2.6 **Waiver of Subrogation.** The insurance carriers for each coverage set forth in Section 2.1 of these General Terms and Conditions shall waive all rights of subrogation that the insurer may have against Owner and against the Owner's Parties, as identified in Section 2.8 of these General Terms and Conditions.

2.7 **No Limitation of Liability**. Failure to obtain and maintain required insurance shall not relieve Contractor of any obligation contained in this Contract. Additionally, any approval by Owner of any of Contractor's insurance policies shall not relieve Contractor of any obligation contained in this Contract, including liability for claims in excess of described limits.

2.8 **Additional Insureds**. Owner, including its employees, directors, agents,successors and assigns, as well as its designees which may include any lessor and/or any mortgagee of the Site as Owner may so designate.

(collectively, the "Owner's Parties") shall be named as an additional insured covering its liability arising out of the Work of Contractor and Subcontractors and their agents, consultants, and employees.

ARTICLE 3 - WAIVER OF CONTRIBUTION AND INDEMNIFICATION

3.1 **Contractor's Waiver and Indemnification**. To the fullest extent permitted by law, Contractor waives any right of contribution and shall indemnify, defend and hold harmless the Owner's Parties from and against all claims, damages, losses, costs or expenses, including, but not limited to, attorneys' fees and expenses and court costs, arising out of or resulting from or in connection with (i) the performance of the Work to the extent that any such claim, damage, loss, or expense is caused in whole or in part by any negligent act or omission, willful misconduct or illegal act of Contractor, Subcontractors, anyone directly or indirectly employed by any of them, or anyone for whose acts any of them may be liable, regardless of whether or not such claim, damage, loss or expense is caused in part by any of the Owner's Parties (it being understood, however, that the Contractor shall not be required to indemnify the Owner's Parties for their comparative liability), and (ii) all liens or claims of liens for materials, equipment, labor and other costs, or any of them, filed against the property where the Project is located, or any part thereof, provided that Owner has made prior payment for same prior to the filing of such liens or claims of liens. Such obligation shall not be construed to negate, abridge, or otherwise reduce any other right or obligation of indemnity or contribution that would otherwise exist as to any party or person described in the Contract Documents. The provisions of this Section 3.1 shall survive the completion of the Work and any earlier termination of this Contract.

3.2 **No Limitation**. In any and all claims, damages, losses, or expenses by any employee of Contractor, Subcontractors, anyone directly or indirectly employed by any of them, or anyone for whose acts any of them may be liable, the indemnification obligation under this Section 3.2 shall not be limited in any way by any limitation on the amounts or types of damages, compensation, or benefits payable by or for Contractor or any Subcontractor under workers' or workmen's compensation acts, disability benefit acts, or other employee benefit acts.

ARTICLE 4 - CHANGE ORDERS

4.1 **No Change in Work Except by Change Order or Owner-Directed Change**. There shall be no change in the Work or adjustments in the Contract Sum except by a written Change Order signed by Owner and Contractor ("Change Order") or by an Owner-directed change in accordance with Section 4.7 of these General Terms and Conditions. To document a Change Order to this Contract, the parties shall use a form mutually agreed upon between Owner and Contractor.

4.2 **Change Event**. Additionally, should Contractor believe that a Change Event has occurred entitling Contractor to a modification in the Contract Sum or Contract Time, Contractor must submit to Owner a properly executed Change Order Request Form within fourteen days from when Contractor knew or reasonably should have known of the Change Event giving rise to the change in the Work. This requirement is a precondition to any claim by Contractor for a change in the Contract Sum or Contract Time. Should Contractor fail to meet this requirement, Contractor shall be deemed to have waived its right to seek a modification to the Contract Sum or Contract Time for the Change Event.

4.3 **Definition of Change Event**. A "Change Event" is defined as: (1) an oral request by Owner believed by Contractor to be a change in the Work without an executed Change Order; (2) a Force Majeure event; (3) Owner's suspension of the Work; or (4) conditions encountered at the Site which are subsurface or otherwise concealed physical conditions which differ materially from those specifically indicated in the Contract Documents.

4.4 **Payment for Change Order Work**. Contractor may be paid a lump sum agreed upon between Owner and Contractor for changed Work that satisfies the requirements and limitations set forth in Sections 4.1 and 4.2 of these General Terms and Conditions.

4.5 **Impact of Change Order on Contract Sum**. The amount of any Change Order shall be added to or deducted from the Contract Sum. The Date of Substantial Completion and/or Date of Final Completion shall be equitably adjusted in the Change Order in order to compensate for any material impact on Contractor's ability to finish by the original Date of Substantial Completion and/or Date of Final Completion.

4.6 **Definition of Force Majeure**. The term "Force Majeure" shall mean an act of God, fire, tornado, hurricane, flood, earthquake, explosion, war on American soil, act of terrorism on the Project, civil disturbance, industry-wide labor strikes, abnormal adverse weather conditions not reasonably anticipatable, industry-wide delay in deliveries, or an unavoidable casualty or other causes beyond Contractor's control, where any such event is not caused by the negligent act or omission or willful misconduct of Contractor or a Subcontractor or anyone else for whom Contractor is or should be responsible.

4.7 **Owner's Right to Make Changes**. Owner reserves the right to require Contractor to make changes to the Work without a signed Change order pursuant to a written directive signed by Owner ("Construction Change Directive"). Contractor shall be compensated for such Owner-directed changes to the Work in accordance with the formula set forth in Section 4.4 of these General Terms and Conditions.

ARTICLE 5 - SAFETY

5.1 Contractor shall be responsible for all necessary safety precautions, programs, and policies in connection with the Work, and shall provide reasonable protection to prevent damage, injury or loss to (a) employees on the Work and other persons who may be affected thereby, whether worker, employee, patron, visitor, invitee, guest, passerby, or otherwise; (b) the Work and materials and equipment to be incorporated therein, whether in storage on or off the Site or under the care, custody or control of Contractor or its Subcontractors; and (c) other property at the Site or adjacent thereto, such as walks, pavement, roadway, structures and utilities not designated for removal, relocation or replacement in the course of construction of the Work.

ARTICLE 6 - WARRANTY

6.1 **Contractor's Warranty**. Contractor hereby warrants and guarantees the following: (a) that all materials shall be new, premium grade and of first-class quality unless otherwise approved by Owner; (b) that all Work shall be performed in a good and workmanlike manner; (c) that the Work and the Construction Documents shall be in compliance with all applicable Legal Requirements; (d) that the Work shall conform to the Contract Documents; and (e) that the Work shall be free from defects. Any Work not in conformance with this guarantee shall be considered defective ("Defective Work"). If required by Owner, Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment used with respect to the Project.

6.2 **Defective Work**. In addition to Contractor's warranty obligations in Section 6.1 of these General Terms and Conditions, Contractor, at Contractor's sole expense and after written receipt of request from Owner to do so, agrees to repair or replace at Owner's option and to Owner's satisfaction any Defective Work for a period of one year from the actual or scheduled Date of Final Completion, whichever is later, or from early termination of this Contract as herein provided; the phrase "repair or replace" includes, without limitation, providing the labor, equipment, and materials required to perform the repair or replacement. Contractor, at Contractor's sole expense, shall repair or replace, at Owner's option and to Owner's satisfaction, all of Owner's materials, equipment, goods, and other property damaged as a consequence of Defective Work. If Contractor performs or causes to be performed any corrective work under this Section 6.2, the one year call-back period shall begin anew from the date of Owner's acceptance of that corrected work. The provisions of this Section 6.2 shall not act as a time limitation on the obligations of Contractor in Section 6.1 of these General Terms and Conditions.

6.3 **Component Warranty Work**. In addition to Contractor's warranty obligations under Sections 6.1 and 6.2 of these General Terms and Conditions, within and limited to one year from the actual Date of Final Completion, or from the early termination of this Contract as herein provided, Contractor, at Contractor's sole expense and after written request from Owner to do so, agrees to repair or replace (as defined in Section 6.2 of these General Terms and Conditions), at Owner's option and to Owner's satisfaction, any of the Work which fails in service but is not otherwise Defective Work.

6.4 **Form of Subcontractor Warranties**. All guarantees and warranties from Subcontractors shall be made on their letterhead, countersigned by the Contractor and addressed to and in favor of Owner. Any guarantees and warranties from manufacturers, other suppliers, or any other persons or entities performing the Work shall run to Owner.

6.5 **Survival**. The provisions of this Article 7 shall survive completion of the Work to be performed under this Contract or the early termination of this Contract.

ARTICLE 7 - PAYMENTS

7.1 **Monthly Submittals.** On or before the fifth day of each month or upon such other time as may be mutually agreed upon, Contractor shall submit to Owner an Application and Certificate for Payment performed during the previous month, less all previous payments, and retainage withheld, together with an original executed and notarized partial waiver of lien to date for Work in substantial form as that form of partial waiver of lien set forth in Exhibit C, subject to the Application and Certificate for Payment for Contractor, on the forms attached hereto in Exhibit D for all Work completed at and materials delivered to the Site during the previous month (or with respect to any waivers of lien as may otherwise be required by the State which has jurisdiction over the Project). The term "Application and Certificate for Payment" means Contractor's certified request for payment for completed portions of the Work. Contractor also shall submit with each Application and Certificate for Payment original executed partial waivers of lien to date for Work subject to the Application for Payment for any Subcontractors. Owner, on or before the last day of each month, will pay to Contractor an amount equal to ninety percent (90%) of the undisputed amount of each Application and Certificate for Payment with ten percent (10%) held as retainage. The retainage shall be paid as part of the final payment. If the Application and Certificate for Payment and supporting materials are received after the application date fixed above, payment shall be made by Owner twenty-five days after Owner receives the Application and Certificate for Payment and supporting materials. A progress payment, or partial or entire use or occupancy of the Project by Owner, shall not constitute acceptance of Work not in accordance with the Contract Documents.

7.2 **Reliance on Contractor's Information**. In taking action on the Contractor's Applications for Payment, Owner shall be entitled to rely on the accuracy and completeness of the information furnished by the Contractor and shall not be deemed to have made a detailed examination, audit or arithmetic verification of the supporting documentation submitted with such Applications for Payment; to have made exhaustive or continuous on-site inspections; or to have made examinations to ascertain how or for what purposes the Contractor has used amounts previously paid on account of the Contract. Such examinations, audits and verifications, if required by Owner, will be performed by Owner's accountants acting in the sole interest of Owner. Owner shall have no obligation to pay or see to the payment of money to a Subcontractor except as may be required by law.

7.3 **Advance Payments**. Except with Owner's prior approval, Contractor shall not make advance payments to suppliers for materials or equipment that have not been delivered and stored at the Site.

7.4 **Payments Withheld**. Owner may withhold payment of an Application and Certificate for Payment, in whole or in part, for the following reasons: (i) Defective Work not remedied; (ii) third party claims made, asserted, or filed against Owner or reasonable evidence indicating such a claim may be asserted; (iii) lien claim made, asserted, or filed regarding the Project; (iv) failure of Contractor to properly make a payment to a Subcontractor or of a Subcontractor to properly make a payment to a subcontractor or other lower tier contractor; (v) improper, erroneous, or incomplete Application and Certificate for Payment; (vi) unauthorized deviation by Contractor from the Contract Documents; (vii) the inability of Contractor, in Owner's reasonable judgment, to complete the Work, or (viii) persistent failure to carry out the Work in accordance with the Contract Documents.

7.5 **Submittals at Substantial and Final Completion**. Upon Substantial Completion of the Work, Contractor shall bind three (3) copies into three respective folders of all guarantees, warranties, certificates of inspection, operation, maintenance and operating instructions, and similar documents and deliver the folders to Owner. Each folder shall contain a summary of the material included, the character of the Work, the name of Contractor and Subcontractors that performed the Work, the period of the guarantees, and the conditions of the guarantees. The Date of Final Completion shall occur only upon Contractor: (i) completing all Punch List items to the satisfaction of Owner, which Punch List shall be prepared after Substantial Completion of the Work as determined by Owner; (ii) tendering to Owner original, executed, and notarized final lien waivers in substantial form as the form of lien waiver set forth in Exhibit C, for Contractor and all Subcontractors, the final Application and Certificate for Payment, and other close-out documentation as required by Owner to Owner's satisfaction; (iii) delivering all executed Change Orders, if any; and (iv) delivering all applicable as-built drawings, warranties, and guarantees not already delivered.

7.6 **Final Payment**. Final payment, consisting of the entire unpaid balance of the Contract Sum, shall be made by Owner to Contractor no later than ten days after Contractor has fully performed this Contract, except for Contractor's responsibility to correct non-conforming Work discovered after final payment or to satisfy other requirements, if any, that extend beyond final payment.

7.7 **Lien Indemnity**. Contractor agrees to keep the property that is the Site of the Project and any funds held by Owner or any lender of Owner free of any liens (including stop notices), provided that Owner has paid to Contractor all amounts which are the subject of such liens. Should any such lien be asserted, Owner, in its sole discretion, may (i) require Contractor, at Contractor's expense, to furnish an appropriate bond or title indemnity of one hundred twenty percent (120%) of the lien amount to remove the effect of the lien from such property or funds; or (ii) withhold funds otherwise due Contractor equal to one hundred twenty percent (120%) of the lien amount to assure payment of such liens.

ARTICLE 8 - TERMINATION OR SUSPENSION OF THE CONTRACT

8.1 **Termination By Contractor**. Contractor may terminate this Contract if the Work is stopped for a period of 60 consecutive days, through no act or fault of Contractor and, if applicable, a Subcontractor, or their agents or employees or any other persons or entities performing portions of the Work under direct or indirect contract with Contractor, for any of the following reasons:

8.1.1 issuance of an order of a court or other public authority having jurisdiction which requires all Work to be stopped;

8.1.2 an act of government, such as a declaration of national emergency, which requires all Work to be stopped; or

8.1.3 Owner has failed to make payment to Contractor in accordance with the Contract Documents, provided that Contractor has provided written notice to Owner of Owner's failure to make payment to Contractor in accordance with the Contract Documents and such written notice is provided to Owner by Contractor prior to the commencement of the aforementioned period of stoppage of the Work.

8.2 **Termination By Contractor for Suspension of the Work**. Contractor may terminate this Contract if, through no act or fault of Contractor or a Subcontractor or their agents or employees or any other persons or entities performing portions of the Work under direct or indirect contract with Contractor, repeated suspensions, delays or interruptions of the entire Work by the Owner constitute in the aggregate more than one hundred twenty days.

8.3 **Termination By Owner for Cause**.

8.3.1 Owner may terminate this Contract if Contractor:

8.3.1.1 persistently or repeatedly refuses or fails to supply enough properly skilled workers or proper materials or equipment;

8.3.1.2 fails to make payment to Subcontractors for materials or labor in accordance with the respective agreements between Contractor and the Subcontractors;

8.3.1.3 disregards or fails to substantially comply prior to the imposition of any fine, penalty or other claim or assessment with respect to Legal Requirements;

8.3.1.4 otherwise defaults or fails or neglects to carry out the Work in accordance with the Contract Documents or fails to properly perform a material obligation under this Contract;

8.3.1.5 persistently or willfully disregards the instructions of Owner with respect to material issues (when such instructions are based on the requirements of the Contract Documents); or

8.3.1.6 (i) is adjudged bankrupt or insolvent, or (ii) makes a general assignment for the benefit of Contractor's creditors, or (iii) if a trustee or receiver is appointed for Contractor or for any of its property, or (iv) files a petition to take advantage of any debtor's act or to reorganize under bankruptcy or similar laws.

8.3.2 When any of the above reasons exist, Owner may without prejudice to any other rights or remedies of Owner, and after giving Contractor seven days' written notice, terminate employment of Contractor and may:

8.3.2.1 take possession of the Site and of all materials, equipment, tools, and construction equipment and machinery thereon owned by Contractor;

8.3.2.2 accept assignment of contracts pursuant to Section 1.6 of these General Terms and Conditions; and

8.3.2.3 finish the Work by whatever reasonable method Owner may deem expedient. Upon request of Contractor, Owner shall furnish to Contractor a detailed accounting of the costs incurred by Owner in finishing the Work.

8.3.3 When Owner terminates this Contract for one of the reasons stated in Section 8.3.1 of these General Terms and Conditions, Contractor shall not be entitled to receive further payment until the Work is finished. If the costs of finishing the Work and other damages incurred by Owner and not expressly waived exceed the unpaid balance, Contractor shall pay the difference to Owner.

8.4 **Suspension By Owner for Convenience**.

8.4.1 Owner may, without cause, order Contractor in writing to suspend, delay or interrupt the Work in whole or in part for such period of time as Owner may determine.

8.4.2 The Contract Sum and Contract Time shall be equitably adjusted for increases in the cost and time caused by suspension, delay or interruption as described in Section 8.4.1 of these General Terms and Conditions. No adjustment shall be made to the extent that performance is, was or would have been so suspended, delayed or interrupted by another cause for which Contractor or a Subcontractor is responsible.

8.5 **Termination By the Owner for Convenience**.

8.5.1 Owner may, at any time, terminate this Contract for Owner's convenience and without cause.

8.5.2 Upon receipt of written notice from Owner of such termination for Owner's convenience, Contractor shall:

8.5.2.1 cease operations as directed by Owner in the notice;

8.5.2.2 take actions necessary, or that Owner may direct, for the protection and preservation of the Work; and

8.5.2.3 except for Work directed to be performed prior to the effective date of termination stated in the notice, terminate all existing contracts and purchase orders and enter into no further contracts and purchase orders.

8.5.3 In case of termination for Owner's convenience, Contractor shall be entitled to receive payment for Work executed and direct costs incurred by reason of such termination (subject to the provision by Contractor to Owner of reasonable supporting documentation).

ARTICLE 9 - NOTICES

9.1 Any and all notices or other communications required by this Contract or by law shall be in writing and shall be deemed served when delivered to the party to whom it is addressed, either by hand delivery (against a signed receipt), overnight mail (including commercial courier service), or certified mail, return receipt requested, with postage prepaid. Either party may change its address for the purposes of this Article by giving written notice of such change to the other party in the manner provided in this Section. For purposes of this Article, all notices to Contractor and Owner shall be sent to the following addresses:

Owner:

National Audubon Society, Inc.
225 Varick Street
New York, NY 10014
Attn: Contract Administration

Contractor:

[Contractor name/address]

With a copy to:

Spring Creek Prairie Audubon Center
11700 SW 100th St
PO Box 117
Denton, NE 68339

ARTICLE 10 - DISPUTE RESOLUTION

Owner and Contractor agree to cooperate in resolving any claim, controversy, or dispute ("Claim" or "Claims") that may arise out of or relate to the Contract, the breach thereof, or the Work.

10.1 **Continuance of the Work**. Owner and Contractor agree that the Work will not be stopped or slowed in any way during the pendency of any Claim; provided, that all monies owed for Work not in dispute are timely paid pursuant to this Contract. Contractor shall continue to prosecute the Work pending final resolution or determination of the Dispute unless requested by Owner to suspend the Work, provided that Owner continues to pay Contractor herein for all Work not subject to a Claim.

10.2 **Claims Involving Concealed or Unknown Conditions**. If conditions are encountered at the site which are (i) subsurface or otherwise concealed physical conditions which differ materially from those indicated in the Construction Documents or (ii) unknown physical conditions of an unusual nature which differ materially from those ordinarily found to exist and generally recognized as inherent in construction activities of the character provided for in the Construction Documents, then the observing party shall give notice to the other party promptly before conditions are disturbed and in no event later than twenty-one days after first observance of the conditions. Owner shall promptly investigate such conditions and, if they differ materially and cause an increase or decrease in Contractor's cost of, or time required for, performance of any part of the Work, shall negotiate with Contractor an equitable adjustment in the Contract Sum or Contract Time, or both. If Owner determines that the conditions at the site are not materially different from those indicated in the Construction Documents and that no change in the terms of this Contract is justified, Owner shall so notify Contractor in writing, stating the reasons. Claims by Contractor in opposition to such determination must be made within twenty-one days after Owner has given notice of the decision. If the conditions encountered are materially different, the Contract Sum and Contract Time shall be equitably adjusted, but if Owner and Contractor cannot agree on an adjustment in the Contract Sum or Contract Time, the adjustment shall proceed pursuant to the dispute resolution procedures set forth in this Article 10.

10.3 **Injury or Damage to Person or Property**. If either party to this Contract suffers injury or damage to person or property because of an act or omission of the other party or of others for whose acts such party is legally responsible, written notice of such injury or damage, whether or not insured, shall be given to the other party within a reasonable time not exceeding twenty-one days after discovery. The notice shall provide sufficient detail to enable the other party to investigate the matter.

10.4 **Negotiations**. In the event a Claim is not resolved or Owner asserts a demand in writing to Contractor in which Owner claims that Contractor has breached this Contract, the parties shall attempt in good faith to resolve the Claim promptly by negotiations, as set forth in this Section 10.4. Any party may give the other party written notice of any Claim not resolved in the normal course of business. Owner and Contractor agree to meet at a mutually acceptable time and place within three days after delivery of such notice, and thereafter as often as reasonably necessary, to attempt to resolve the Claim. If a party intends to be accompanied at a meeting by legal counsel, the other party shall be given at least three business days' notice and also may be accompanied by legal counsel. All negotiations pursuant to this clause are confidential and shall be treated as compromise and settlement negotiations for purposes of all rules of evidence. If the matter is not resolved within fifteen days from the initial written notice of the Claim, or if no meeting takes place within ten days after such initial notice, either party may initiate mediation as provided herein.

10.5 **Dispute resolution**.

10.5.1 All Claims that cannot be resolved by the parties under Section 10.4 of these General Terms and Conditions shall be submitted to mediation before the American Arbitration Association ("AAA") in the Borough of Manhattan, New York, New York, or such other venue mutually determined by the parties hereto, and in accordance with the Construction Industry Mediation Rules of the AAA then in effect. Submission to mediation is a condition precedent to arbitration as set forth below. Request for mediation shall be made in writing and delivered to the other party to the Contract and filed with the American Arbitration Association. The request may be made concurrently with the filing of binding dispute resolution proceedings but, in such event, mediation shall proceed in advance of binding dispute resolution proceedings, which shall be stayed pending mediation for a period of thirty (30) days from the date of filing, unless stayed for a longer period by agreement of the parties or court order.

10.5.2 The parties shall share the mediator's fee and any filing fees equally. Agreements reached in mediation shall be enforceable as settlement agreements in any court having jurisdiction thereof. All mediation proceedings shall be confidential and no information exchanged in such mediation shall be discoverable or admissible in any arbitration or legal or equitable proceeding involving the parties, unless otherwise discoverable or admissible.

10.6 **Arbitration.**

10.6.1 **AAA/Notice**. All Claims not resolved under Sections 10.4 or 10.5 of these General Terms and Conditions shall be decided by confidential, binding arbitration in an arbitration proceeding taking place in the Borough of Manhattan, New York, New York, or such other venue designated by Owner, and in accordance with the Construction Industry Arbitration Rules of the AAA then in effect. A demand for arbitration shall be made in writing, delivered to the other party to this Contract, and filed in writing with the AAA. A demand for arbitration shall be made no earlier than concurrently with the filing of a request for mediation, but in no event shall the demand for arbitration be made after the date when the institution of legal or equitable proceedings based on such Claim would be barred by the applicable statute of limitations. The party filing a notice of demand for arbitration must assert in its demand all Claims then known to that party on which arbitration is permitted to be demanded.

10.6.2 **Discovery**. Each party shall produce to the other all non-privileged records relating to the Work that have relevant information or are reasonably calculated to lead to the discovery of relevant information relating to the Claim. The Arbitrator shall resolve all discovery disputes. The Arbitrator may modify these discovery limitations for good cause shown.

10.6.3 **Arbitrator**. The Arbitrator shall have authority to order specific performance including, without limitation, interim injunctive relief prior to the Claim being resolved. The Arbitrator shall have the authority to decide all issues concerning the fulfillment of any condition precedent to the arbitrability of a claim or defense, the amount of damages to be awarded, if any, and the arbitrability of the issues presented. The Arbitrator shall not be empowered to award damages in excess of compensatory damages such as punitive damages. Notwithstanding anything to the contrary, the term "Arbitrator" as used herein shall mean one (1) arbitrator, regardless of the size of the claim or counterclaim. An arbitrator eligible to hear the Claim shall have at least ten (10) years experience as an arbitrator with the AAA and/or another neutral organization, be familiar with construction industry practices, and be an attorney.

10.6.4 **Joinder**. Either party, at its sole discretion, may consolidate an arbitration conducted under this Contract with any other arbitration to which it is a party, provided that (i) the arbitration agreement governing the other arbitration permits consolidation, (ii) the arbitrations to be consolidated substantially involve common questions of law or fact, and (iii) the arbitrations employ materially similar procedural rules and methods for selecting arbitrator(s). Each party, at its sole discretion, may include by joinder persons or entities substantially involved in a common question of law or fact whose presence is required if complete relief is to be accorded in arbitration. Contractor agrees to include a similar joinder clause in its agreement with any Subcontractor requiring such entity to be joined in any arbitration, by consolidation, joinder, or otherwise that is in accordance with this Section.

10.6.5 **Award**. The award of the Arbitrator shall be final, shall include responsibility for the payment of the fee of the arbitrator(s) and any filing fees (in the event that the arbitration is cancelled prior to the rendering of a decision, the parties shall share the arbitration fee and any filing fees equally), and shall be enforceable in any court of competent jurisdiction, and each party consents and submits to the jurisdiction of such court for purposes of such action.

ARTICLE 11 - OWNER REVIEW AND INSPECTION OF WORK

11.1 **Owner's Site Inspections**. Owner may visit the Site to keep informed about the progress and quality of the portion of the Work completed. However, Owner shall not be required to make on-site inspections to check the quality or quantity of the Work. Visits by Owner shall not be construed to create an obligation on the part of Owner to make such on-site inspections. Owner shall neither have control over or charge of, nor be responsible for, the construction means, methods, techniques, sequences or procedures, or for the safety precautions and programs in connection with the Work, since these are solely the Contractor's rights and responsibilities under the Contract Documents.

11.2 **Owner Not Responsible for Performance of Work**. Owner shall not be responsible for the failure of Contractor to perform the Work in accordance with the requirements of the Contract Documents. Owner shall not have control over or charge of and will not be responsible for acts or omissions of Contractor and its Subcontractors or their agents and employees performing portions of the Work.

11.3 **Owner's Rejection of the Work**. Owner may reject Work that does not conform to the Contract Documents. Whenever Owner considers it necessary or advisable, Owner shall have the authority to require inspection or testing of the Work if required by Governmental Authorities, whether or not such Work is fabricated, installed or completed. However, neither this authority of Owner nor a decision made in good faith either to exercise or not to exercise such authority shall give rise to a duty or responsibility of Owner to Contractor, the Subcontractors or other persons or entities performing portions of the Work.

11.4 **Determination of Substantial Completion and Final Completion**. Together with the Contractor, Owner shall conduct inspections to determine Substantial Completion and final completion.

ARTICLE 12 - OWNER'S RIGHT TO STOP WORK AND CARRY OUT THE WORK

12.1 **Owner's Right to Stop Work**. If Contractor fails to correct Work that is not in accordance with the requirements of the Contract Documents or persistently fails to carry out the Work in accordance with the Contract Documents, Owner may issue a written order to Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, the right of Owner to stop the Work shall not give rise to a duty on the part of Owner to exercise this right for the benefit of Contractor or any other person or entity.

12.2 **Owner's Right to Carry Out the Work**. If Contractor defaults or neglects to carry out the Work in accordance with the Contract Documents and fails within a seven day period after receipt of written notice from Owner to commence and continue correction of such default or neglect with diligence or promptness, Owner may, after such seven day period and without prejudice to other remedies that Owner may have, correct such deficiencies. In such case, an appropriate Change Order shall be issued deducting from payments then or thereafter due the Contractor the reasonable costs of correcting such deficiencies. If payments due to Contractor are not sufficient to cover such amounts, Contractor shall pay the difference to Owner.

ARTICLE 13 – MISCELLANEOUS.

13.1 **Independent Contractor**. The Contractor is an independent contractor and is solely responsible for its actions or inactions and those of its employees, consultants, and Subcontractors and no document, action or assertion shall be construed to create an employment or agency relationship between Owner and the Contractor, its employees, consultants and Subcontractors. The Contractor shall have and maintain responsibility for all of its employees and operations.

13.2 **Rights and Remedies**. Duties and obligations imposed by the Contract Documents and rights and remedies available thereunder shall be in addition to and not a limitation of duties, obligations, rights and remedies otherwise imposed or available by law. No action or failure to act by Owner or Contractor shall constitute a waiver of a right or duty afforded them under the Contract Documents, nor such shall action or failure to act constitute approval of or acquiescence in a breach thereunder, except as may be specifically agreed in writing.

13.3 **Integration**. This Contract constitutes the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations or agreements, either written or oral.

13.4 **Interpretation**. Article and section headings are for convenience of reference only and are in no way intended to interpret, define, or limit the scope or content of this Contract or any provision hereof and shall be given no legal effect in the interpretation of this Contract. In the interest of brevity, the Contract Documents frequently omit modifying words such as “all” and “any” and articles such as “the” and “an,” but the fact that a modifier or an article is absent from one statement and appears in another is not intended to affect the interpretation of either statement.

13.5 **Capitalization**. Terms capitalized in this Contract included those that are (i) specifically defined, or (ii) the titles of numbered articles and identified references to sections in the Contract.

13.6 **Governing Law**. This Contract shall be governed by and construed in accordance with the laws of the State of New York without giving effect to its principles of conflicts of laws. The terms of this Contract shall supersede any inconsistent terms in any other Contract Documents, including, without limitation, the exhibits attached hereto.

13.7 **Successors and Assigns**. Contractor shall not assign or transfer this Contract without first procuring the prior written consent of Owner, which consent may be withheld in Owner’s sole and absolute discretion. Owner may assign or transfer its interest in this Contract, the Site, and the Project without the consent of Contractor or other limitation. Owner shall have no further duties or obligations under this Contract upon its assignment of all of its rights. This Contract shall be binding upon and inure to the benefit of the parties hereto, their successors, assigns and legal representatives.

13.8 **Time Limits on Claims**. The Owner and the Contractor shall commence all Claims and causes of action, whether in contract, tort, breach of warranty or otherwise, against the other arising out of or relating to the Contract in accordance with the requirements of dispute resolution method set forth herein within the time period specified by applicable law, but in any case not more than ten years after the date of Substantial Completion of the Work. The Owner and Contractor waive all Claims and causes of action not commenced in accordance with this Section.

13.9 **No Use of Name**. Contractor 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 Contractor (including publicly naming Audubon as a client), without Audubon’s prior written consent.

13.10 **Confidentiality**. Contractor 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 Owner, Contractor 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 Contractor shall be the property of Owner and Contractor shall deliver any such documents to Owner upon request by Owner. Contractor 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 section.

13.11 **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), Contractor certifies that Contractor and its 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 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.

[13.12 **Compliance with Grant Agreement(s)**. [OPTIONAL] Contractor acknowledges that Audubon's funding for the services to be performed under this Agreement is made pursuant to the following government grant agreement(s) (the "Master Grant"), attached hereto as EXHIBIT E, the terms of which are incorporated herein: _____, as amended. Contractor acknowledges and agrees to comply with all the terms and conditions of the Master Grant(s) with which Audubon must comply, as if Contractor was named therein in place of Audubon.]

EXHIBIT A-1

Contractor's Contract Sum Breakdown Worksheet

(see attached sheets)

EXHIBIT A-2

Contractor's Proposal

(see attached sheets)

EXHIBIT A-3

Architectural Plans and Specifications

(see attached sheets)

EXHIBIT B

(Reserved)

EXHIBIT C

Forms of Final Release, Waiver of Liens and Indemnification

CONTRACTOR AFFIDAVIT
AND PARTIAL RELEASE OF CLAIMS, LIEN WAIVER
AND INDEMNIFCATION

Date:_____

National Audubon Society ("Owner")
225 Varick Street
New York, NY 10014
Attn: Contracts Administration

Re: Project/Location: _____
_____
_____

General Contractor: _____
Contract Date: __/__/__
Payment Requisition Date: __/__/__
Pay Application No.: _____
Pay Period: __/__/__

Original Contract Amount: _____
Approved Change Orders: _____
Revised Contract Amount: _____
Payments Received to Date: _____
Current Progress Payment: _____
Outstanding Progress Payments: _____
Aggregate Payment Amount: _____

THE STATE OF _____)
) ss.
COUNTY OF _____)

BEFORE ME, the undersigned authority, on this day personally appeared _____, known to me to be a credible person and officer of _____ (hereinafter "Contractor"), and, in consideration of and conditioned upon payment of the Current Progress Payment Amount set forth above and all other previous payments made to Subcontractor/Material Supplier by Contractor and/or Owner, subject to collection, being duly sworn and upon his oath, hereby declares and acknowledges as follows:

1. I am the duly authorized agent for Contractor, which has authorized me to make this affidavit, to enter into the agreements and to grant the waivers herein set forth, on its behalf and as its acts and deeds. All the statements in this Partial Release, Waiver of Liens and Indemnification are true and correct.

2. In connection with an agreement dated _____ 201__, between _____ ("Owner"), and Contractor, Contractor has supplied materials which have been incorporated into, and/or performed

labor in connection with, the construction of improvements upon certain real property located at _____, _____ (name of project) (the "Project").

3. Contractor has received payment in the amount of _____ Dollars ($_____)[1] during the period through _____, 20__.[2] Accordingly, Contractor hereby unconditionally waives, releases, remises and relinquishes any and all class of liens, as well as any and all right to claim, demand, file or impose such lien now or in the future, as well as any and all causes of action, suits, demands, rights and interests (whether choate or inchoate and including, without limitation, all mechanic's and materialmen's liens under the Constitution and statutes of the District of Columbia) owned, claimed, or held by Contractor against Contractor sureties, the Owner, the Owner's lenders and guarantors, the Project, the real property of Owner and/or the Improvements located thereupon or any part thereof for any other reason through _____, 20__.[3]

4. In consideration of and conditioned upon the payment by Owner of the sum of _____ Dollars ($_____)[4], the sufficiency of which is hereby acknowledged, Contractor hereby waives, releases, remises and relinquishes any and all class of liens, as well as any and all right to claim, demand, file or impose any such lien now or in the future, as well as any and all causes of action, suits, demands, rights and interests (whether choate or inchoate and including, without limitation, all mechanic's and materialmen's liens under the Constitution and statutes of the District of Columbia) owned, claimed, or held by Contractor against Contractor sureties, the Owner, the Owner's lenders and guarantors, the Project, the real property of Owner and/or the Improvements located thereupon or any part thereof for any other reason through _____, 20__.[5]

5. Notwithstanding anything to the contrary contained herein, including the waivers and releases set forth in Paragraphs 3 and 4, this affidavit and partial release is not a waiver of Contractor's rights with respect to payment for retainage or for claims made not related to, or the subject of, the Current Progress Amount and/or Payments Received to Date, and made in accordance with the terms of the Contract Documents listed (general description and amount) on Exhibit A attached hereto.

6. Contractor represents and warrants that all of its (i) costs and expenses, subcontracts and subcontractors, work orders and material suppliers, and other persons or firms who furnished material, labor and/or services to Contractor in connection with the Project, the real property of Owner and/or the Improvements located thereupon, as well as (ii) all social security taxes, withholding taxes, sales and use taxes, permits, workers compensation and insurance premiums in connection with the Contract, through ___ _____ [6], have been paid in full and satisfied.

7. Contractor further represents and warrants that if any claim or lien be filed in connection with any material supplied or labor performed by virtue of Contractor's participation, and/or that of its subcontractors and/or material suppliers, in the construction of the Project and/or Improvements located upon the real property of Owner for which Owner has made proper payment, then Contractor shall immediately, within fifteen (15) days after the filing and notice thereof, which may now or in the future affect the Project or real property described above or any personal property of Owner located thereon: (y) pay and discharge of record all class of liens filed against the Owner, the Project, the real property of Owner and/or the Improvements located thereupon, by virtue of Contractor's participation, and/or that of its subcontractors and/or material suppliers, in the construction of the Project and/or Improvements located upon the real property of Owner, or (z) furnish a bond for the release of each such lien, obtain settlement of

[1] Insert total of all "Payments Received to Date" for all materials supplied and labor performed by or on behalf of Contractor in connection with the Improvements.
[2] Insert date of end of progress payment period for which payments have been received.
[3] Insert date of end of progress payment period for which payments have been received.
[4] Insert amount approved for payment in present Application, "Current Progress Payment", for Payment.
[5] Insert date of end of prior progress payment period.
[6] Insert date of end of progress payment period for which payments have been received.

each such lien, and furnish Owner (and its lenders and guarantors) written full release of such liens. Contractor further hereby agrees to indemnify and hold Owner (and its lenders and guarantors), its employees, representatives and agents harmless from and defend them against any and all actions, claims, and demands related to such liens and reimburse them for all costs and expenses (including, without limitation, attorneys' fees and court costs) incurred in connection with any such action, claim, demand or lien or the enforcement thereof.

EXECUTED this _____ day of _____, 20___.

CONTRACTOR_____

By:_____
Title:_____

SUBSCRIBED AND SWORN TO before me the said Contractor Affidavit and Partial Waiver of Claims and Liens, this ____ day of _____, 20___, to certify which witness my hand and seal of office.

_____
NOTARY PUBLIC in and for

_____ County, _____

My Commission Expires:

_____

SUBCONTRACTOR/MATERIAL SUPPLIER AFFIDAVIT AND PARTIAL RELEASE OF CLAIMS, LIEN WAIVER AND INDEMNIFCATION

Date:_____

National Audubon Society ("Owner")
225 Varick Street
New York, NY 10014
Attn: Contracts Administration

Re: Project/Location: _____
_____
_____

General Contractor/Construction Manager: _____
Subcontractor/Material Supplier/Material Supplier: _____
Trade: _____
Subcontract Date: __/__/__
Payment Requisition Date: __/__/__
Pay Application No.: _____
Pay Period: __/__/__

Original Contract Amount: _____
Approved Change Orders: _____
Revised Contract Amount: _____
Payments Received to Date: _____
Current Progress Payment: _____
Outstanding Progress Payments: _____
Aggregate Payment Amount: _____

THE STATE OF _____)
) ss.
COUNTY OF _____)

BEFORE ME, the undersigned authority, on this day personally appeared _____, known to me to be a credible person and officer of _____ (hereinafter "Subcontractor/Material Supplier/Material Supplier"), and, in consideration of and conditioned upon payment of the Current Progress Payment Amount set forth above and all other previous payments made to Subcontractor/Material Supplier by Contractor and/or Owner, subject to collection, being duly sworn and upon his oath, hereby declares and acknowledges as follows:

1. I am the duly authorized agent for Subcontractor/Material Supplier, which has authorized me to make this affidavit, to enter into the agreements and to grant the waivers herein set forth, on its behalf and as its acts and deeds. All the statements in this Partial Release, Waiver of Liens and Indemnification are true and correct.

2. In connection with an agreement dated _____ 201__, between _____ ("Owner"), and _____ ("Contractor"), and pursuant to an agreement dated _____, 20___ between Contractor and Subcontractor/Material Supplier (the "Subcontract"), Subcontractor/Material Supplier has supplied materials which have been incorporated into, and/or performed labor in connection with, the construction of improvements upon certain real property located at _____, _____ (name of project)

(the "Project"). Subcontractor/Material Supplier's scope of work incudes, but is not necessarily limited to, _____[7], as part of the overall scope of work at _____ collectively, the "Improvements").

3. Subcontractor/Material Supplier has received payment in the amount of _____ Dollars ($_____)[8] during the period through _____, 20__.[9]. Accordingly, Subcontractor/Material Supplier hereby unconditionally waives, releases, remises and relinquishes any and all class of liens, as well as any and all right to claim, demand, file or impose any such lien now or in the future, as well as any and all causes of action, suits, demands, rights and interests (whether choate or inchoate and including, without limitation, all mechanic's and materialmen's liens under the Constitution and statutes of the State of New York) owned, claimed, or held by Subcontractor/Material Supplier against the Contractor, Contractor's sureties, the Owner, Owner's lenders and guarantors, the Project, the real property of Owner and/or the Improvements located thereupon or any part thereof for any other reason through _____, 20__.[10]

4. In consideration of and conditioned upon the payment by Contractor of the sum of _____ Dollars ($_____)[11], the sufficiency of which is hereby acknowledged, Subcontractor/Material Supplier hereby waives, releases, remises and relinquishes any and all class of liens, as well as any and all right to claim, demand, file or impose any such lien now or in the future, as well as any and all causes of action, suits, demands, rights and interests (whether choate or inchoate and including, without limitation, all mechanic's and materialmen's liens under the Constitution and statutes of the State of New York) owned, claimed, or held by Subcontractor/Material Supplier against the Contractor, Contractor's sureties, the Owner, Owner's lenders and guarantors, the Project, the real property of Owner and/or the Improvements located thereupon or any part thereof for any other reason through _____, 20__.[12]

5. Notwithstanding anything to the contrary contained herein, including the waivers and releases set forth in Paragraphs 3 and 4, this affidavit and partial release is not a waiver of Subcontractor/Material Supplier's rights with respect to payment for retainage or for claims made not related to, or the subject of, the Current Progress Amount and/or Payments Received to Date, and made in accordance with the terms of the Subcontract listed (general description and amount) on Exhibit A attached hereto.

6. Subcontractor/Material Supplier represents and warrants that all of its (i) costs and expenses, subcontracts and subcontractors, work orders and material suppliers, and other persons or firms who furnished material, labor and/or services to Subcontractor/Material Supplier in connection with the Project, the real property of Owner and/or the Improvements located thereupon, as well as (ii) all social security taxes, withholding taxes, sales and use taxes, permits, workers compensation and insurance premiums in connection with the Subcontract, through ___ _____[13] , have been paid in full and satisfied.

7. Subcontractor/Material Supplier further represents and warrants that if any claim or lien be filed in connection with any material supplied or labor performed by virtue of Subcontractor/Material Supplier's participation, and/or that of its subcontractors and/or material suppliers, in the construction of the Project and/or Improvements located upon the real property of Owner for which Owner has made proper payment, then Subcontractor/Material Supplier shall immediately, within fifteen (15) days after the filing and notice thereof, which may now or in the future

[7] Insert Subcontractor/Materialman Description of Scope of Work or Trade.
[8] Insert total of all "Payments Received to Date" for all materials supplied and labor performed by or on behalf of Subcontractor/Material Supplier in connection with the Improvements.
[9] Insert date of end of progress payment period for which payments have been received.
[10] Insert date of end of progress payment period for which payments have been received.
[11] Insert amount approved for payment in present Application, "Current Payment Due", for Payment.
[12] Insert date of end of prior progress payment period.
[13] Insert date of end of progress payment period for which payments have been received.

affect the Project or real property described above or any personal property of Owner located thereon: (y) pay and discharge of record all class of liens filed against the Owner, the Project, the real property of Owner and/or the Improvements located thereupon, by virtue of Subcontractor/Material Supplier's participation, and/or that of its subcontractors and/or material suppliers, in the construction of the Project and/or Improvements located upon the real property of Owner, or (z) furnish a bond for the release of each such lien, obtain settlement of each such lien, and furnish Owner (and its lenders and guarantors) written full release of such liens. Subcontractor/Material Supplier further hereby agrees to indemnify and hold Owner (and its lenders and guarantors), its employees, representatives and agents harmless from and defend them against any and all actions, claims, and demands related to such liens and reimburse them for all costs and expenses (including, without limitation, attorneys' fees and court costs) incurred in connection with any such action, claim, demand or lien or the enforcement thereof.

EXECUTED this _____ day of _____, 20___.

SUBCONTRACTOR/MATERIAL SUPPLIER_____

By:_____
Title:_____

SUBSCRIBED AND SWORN TO before me the said Subcontractor/Material Supplier Affidavit and Partial Waiver of Claims and Liens, this ____ day of _____, 20___, to certify which witness my hand and seal of office.

_____
NOTARY PUBLIC in and for

_____ County, _____

My Commission Expires:

_____

CONTRACTOR'S FINAL RELEASE,
WAIVER OF LIENS AND INDEMNIFICATION

_____, 201__

National Audubon Society
225 Varick Street
New York, NY 10014
Attn: Contracts Administration

Re: Project / Location:

Contractor:	_____
Contract Date:	_____, 201__
Payment Requisition Date:	__/__/__
Final Payment Amount:	$_____
Aggregate Payment Amount:	$_____

The undersigned (hereinafter referred to as "Contractor"), in consideration of and conditioned upon payment in full for all labor, and materials furnished or performed in connection with the Project and the property upon which the Project is located, and agrees that the Contractor:

a) waives, releases, remises and relinquishes all actions, debts, claims and demands of any nature that the Contractor now has or may ever have against Owner, its officers, directors, employees, partners, successors, principals, agents, shareholders, affiliates, subsidiaries and assigns, on account of all work, services, equipment and materials performed or furnished by Contractor or anyone claiming by or through Contractor (collectively, "Potential Lienors") in connection with the design, construction, renovation and/or other work involving the Project or real property upon which the Project is located (collectively, the "Work");

b) waives, releases, remises and relinquishes any mechanic's, materialman's or other class of liens on account of the Work and any and all right to claim, demand, file or impose any such lien now or in the future with respect to the Work;

c) certifies that all due and payable bills with respect to the Work have been paid to date or shall be paid from the proceeds of the Final Payment Amount, and that, to Contractor's knowledge, there are no (i) mechanic's, materialman's or other class of liens which have been submitted to Contractor as of the date hereof, and (ii) mechanic's, materialman's or other class of liens that have been filed with respect to the Work;

d) represents and warrants that (i) all its design professionals and consultants, subcontractors, material suppliers and other persons or firms who furnished material, labor and/or services in connection with the Work have been paid in full for the Work or shall be paid in full from the proceeds of the Final Payment Amount, and (ii) all social security taxes, withholding taxes, sales and use taxes, permits, workers compensation and insurance premiums in connection with the Contract have been paid in full; and

e) agrees to promptly pay and discharge of record all mechanic's, materialman's or other class of liens filed by Potential Lienors in connection with the Work within twenty (20) days after notice of the filing thereof, which may now or in the future affect the Project or real property described above, or any personal property of Owner located thereon, and to indemnify and hold Owner, the owner of the Property upon which the Project is located and their employees, representatives and agents harmless from and defend them against any and all actions, claims, and demands related to such liens and reimburse them for all costs and expenses (including, without limitation, attorneys' fees and court costs) incurred in connection with any such action, claim, demand or lien or the enforcement thereof.

This Final Release, Waiver of Liens and Indemnification is being executed by an officer or duly authorized agent of Contractor and delivered simultaneously with payment of the Final Payment Amount.

_____

By: _____
Name:
Title:

Sworn to and subscribed before me
this ____ day of _____, 201__

_____
Notary Public

My Commission Expires: _____

SUBCONTRACTOR/MATERIAL SUPPLIER'S
FINAL RELEASE, WAIVER OF LIENS AND INDEMNIFICATION

_____, 201__

National Audubon Society
225 Varick Street
New York, NY 10014
Attn: Contracts Administration

Re: Project / Location:

Contractor: _____
Contract Date: _____, 201__
Payment Requisition Date: __/__/__
Final Payment Amount: $_____
Aggregate Payment Amount: $_____

Contractor: _____
Design Professional/Subcontractor/
Material Supplier: _____
Contract or Work Order Date: __/__/__
Payment Requisition Date: __/__/__
Final Payment Amount: $_____
Aggregate Payment Amount: $_____

The undersigned (hereinafter referred to as "Design Professional/Subcontractor/Material Supplier"), in consideration of and conditioned upon payment in full for all labor and materials furnished or performed in connection with the Project and the property on which the Project is located, and agrees that Design Professional/Subcontractor/Material Supplier:

a) waives, releases, remises and relinquishes any mechanic's, materialman's or other class of liens on account of the Design Professional/Subcontractor/Material Supplier's Work and any and all right to claim, demand, file or impose any such lien now or in the future in connection with the construction, renovation and/or other work involving the Project or real property upon which the Project is located (collectively, the "Work"); and

b) represents and warrants that (i) all its subcontractors, material suppliers and other persons or firms who furnished material, labor and/or services to Design Professional/Subcontractor/Material Supplier in connection with the Design Professional/Sub-contractor/Material Supplier's Work have been paid in full for the Work or shall be paid in full out of the proceeds of the Final Payment Amount, and (ii) all social security taxes, withholding taxes, sales and use taxes, permits, workers compensation and insurance premiums in connection with the Contract have been paid in full.

This Final Release, Waiver of Liens and Indemnification is being executed by an officer or duly authorized agent of Design Professional/Subcontractor/Material Supplier and delivered simultaneously with Payment of the Final Payment Amount.

SUBCONTRACTOR/MATERIAL SUPPLIER:

_____

By: _____
Name:
Title:

Sworn to and subscribed before me
this ____ day of _____, 2012

_____
Notary Public

My Commission Expires: _____

EXHIBIT D

Forms of Application and Certificate for Payment

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 **New Maintenance Building 2021**, pursuant to the terms and conditions set forth in the contract documents dated **September 24, 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: 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

C. Engineer's Secondary 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

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. A pre-bid meeting will be scheduled by the Owner's Project Administrator after the invitation to Bid is Issued. This pre-bid meeting is not mandatory, but prospective bidders are encouraged to attend this pre-bid meeting to fully understand the Work. 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. 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, screws, nails, connectors and other accessories required to provide complete and satisfactory piping, electrical, framing, finish, and other building and utility 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 kept accessible 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.

B. Contractor shall conduct weekly reviews of the erosion control measures and make any repairs or adjustments necessary.

1.8. CODE COMPLIANCE

A. All proposed work shall comply with locally adopted editions of 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 west of the existing maintenance building. If additional storage and staging space is necessary, use of the north end of the parking lot may be allowed at the owner's discretion for limited and specific time periods as coordinated with the Center's event schedule..

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 01 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. Building pad, aggregate, and seeding

2. Building utilities

3. Building structure and shell

4. Building interior plumbing, electrical, HVAC, and lighting
5. Building finishes

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. Crushed concrete or limestone are acceptable. Use 1” clean crushed limestone for all aggregate surfacing.

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 the seed mix suitable for the planting season, as specified in Part 3 of this specification section.

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

PART 3 - EXECUTION

3.1. INTENT OF CONTRACT

A. The intent of the Contract is to construct a new maintenance building at Spring Creek Prairie Audubon Center, complete with utilities, grading, and surfacing.

B. The planned building is an un-insulated pre-engineered metal structure with a concrete floor, concrete stem walls, and a stick-framed insulated and conditioned space containing a storage room, office, and restroom. The un-insulated main bay will be used in support of the center’s groundskeeping activities and will include a storage mezzanine over the top of the insulated space. The building will include HVAC, plumbing, electrical, and communication systems.

C. Work exterior to the building includes finish grading, utility trenching, aggregate surfacing, and seeding.

D. The existing site contains a rough-graded building pad with un-surfaced building access paths. Utility connection points are provided on the drawings.

E. 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. Grading: Review Sections 31 22 00 and 31 23 23. Complete final grading of the building pad and access driveways. Excavate, backfill, and compact as needed to construct the building foundation and floor.

1. Remove topsoil from excavation and fill 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. Compact fill and backfill in steps as required to achieve 95% Modified Proctor density. Add water as needed to achieve optimal moisture content for compaction.

B. Install water, sewer, electric, and communication utilities from their respective connection points to the maintenance building. This work includes connecting each utility line to the existing utility infrastructure on site.

1. Exterior water piping shall be 1” HDPE SDR 11

a. Connect to the water supply piping in the caretaker’s residence. Provide a shutoff valve in the residence.

b. Route the water piping to avoid damage to trees and bushes in the caretaker’s yard.

c. Maintain 5’ bury depth

d. Joints:

i. Below ground joints must be made by electrofusion

ii. Above-ground joints may use mechanical fittings.

e. Install metallic locate tape 1” to 1’ over the top of the piping run.

2. Sewer piping shall be PVC Schedule 40

a. Connect the building sewer system to the existing sewer collection system below the cleanout indicated in the drawings.

b. Route the sewer piping to avoid damage to trees and bushes in the caretaker’s yard.

c. Maintain 5’ bury depth.

d. Use socket type fittings with adhesive primer and solvent cement

e. Install metallic locate tape 6” to 1’ over the top of the piping run.

3. Electrical supply cable shall be suitable for the shown line length to serve a 240V, 200A service panel.

a. Install the cable in below-ground conduit with minimum bends and adequate conduit diameter for pulling.

b. Install a pull box at a suitable intermediate location such as the caretaker’s residence wall or the yard flood light pole.

c. Maintain a 2’ to 3’ bury depth.

d. Assemble conduit according to manufacturer’s recommendations for a liquid tight run.

4. Communications cable shall be coordinated with the Owner’s communication utility provider: Windstream.

C. Concrete Work: Review section 03 30 00. Construct a concrete foundation, floor, and stem wall with appropriate utility penetrations, access opening, and building anchoring hardware according to the drawings, these specifications, and the requirements of the building manufacturer.

1. Submittals: according to Section 03 30 00.

2. Mix criteria:

a. Aggregates Maximum sizes:

i. Footings – 1-1/2”

ii. All other concrete – ¾”

iii. The smaller of the above or: not larger than 1/5 of the narrowest dimension between sides of forms, 1/3 of the depth of slabs, nor ¾ of the minimum clear spacing between individual reinforcing bars or bundles of bars.

b. Admixture Usage: All concrete slabs placed at air temperatures below 50°F shall contain the manufacturer-specified non-corrosive, non-chloride accelerator. All pumped concrete and concrete with a water/cement ratio below 0.50 shall contain high-range water-reducing admixture (superplasticizer).

c. Water/cement ratio: All concrete subjected to freezing and thawing shall have a maximum water/cement ratio of 0.50.

3. Performance and testing criteria:

a. Compressive Strength in place, at 28 days, minimum as follows: footings, walls, interior slabs on grade: minimum of 4,000 psi unless otherwise indicated on the drawings.

b. Slump: Maximum of 5.0 inches and a minimum of 3.0 inches as determined by ASTM C 143.

c. Air content limits:

i. All interior slabs subject to abrasion shall have a maximum air content of 4%.

ii. All concrete exposed to freezing and thawing and/or required to watertight shall have an air content between 5% and 8%

4. Concrete finishing.

i. Walls: use rough form finish.

ii. Floor and slabs: use trowel finish.

iii. Grout or otherwise protect any form ties

5. Inspection of forms, trenches, and reinforcement: At least 48 hours prior to placing of concrete notify the Engineer so that a qualified representative may inspect forms, trenches and reinforcing in place and secure approval for the placement of concrete.

6. Testing will be conducted at the discretion of the Engineer and Owner. The contractor will not be responsible for the cost of initial testing but will be responsible for the cost of re-testing corrected work which failed initial testing. Removal and replacement of defective concrete is detailed in section 03 30 00.

D. Procure and erect a pre-engineered metal building package on the concrete foundation. Review Section 13 34 19.

1. Submittals as indicated in Section 13 34 19, and as follows:

a. Building reactions

b. Building anchoring plan

c. Exterior wall panel colors with pricing

d. Exterior trim colors with pricing

2. For initial pricing, include the manufacturer’s standard exterior wall panel color most closely matching tan or sand.

E. Rough Carpentry: Review Section 06 10 00. Frame, seal, insulate, and finish a conditioned space within the pre-engineered metal building.

1. Submittals:

a. Submit manufacturers data on fire-retardant lumber.

F. Install a central HVAC system. Select, procure, and install an air handling unit on the mezzanine floor near the north wall, at least 16’ from the stairs. Provide air intake and distribution ductwork as sown on the drawings. Provide a thermostat in the office for temperature control.

1. Submittals:

a. Manufacturer’s data sheets for proposed AHU and condenser

2. The air handling unit shall have the following specifications and features:

a. All major components from the same manufacturer

b. Compact footprint, horizontal or vertical

c. Single zone

d. Replaceable filter, oriented to be accessible from the mezzanine.

e. Minimum 3kW electric heating coil

f. Minimum 2-ton cooling coil

g. Exterior pad-mounted condenser unit

h. Condensate drain line discharges to building sewer system

G. Install interior water and sewer in the building. This work includes the procurement and installation of a filter, water softener, water heater, plumbing fixtures, vacuum-breaker valves, isolation valves, cleanouts, and all other appurtenances required to create a fully functional building water and sewer system.

1. Submittals:

a. Proposed tankless water heater. Include Manufacturer’s data sheet and IOM (Installation & Operation Manual).

b. Proposed water softener. Include Manufacturer’s data sheet and IOM.

c. Proposed water filter. Include Manufacturer’s data sheet and IOM.

2. Specialty water equipment shall have the following features and capacities:

a. Tankless water heater: capable of producing 110°F water using groundwater from the project location at a rate of 3.5 gpm.

b. Water softener: Minimum 20,000 grain capacity and 8 gpm with programmable automatic regeneration cycle.

c. Water filter: 5-micron cartridge filter with transparent housing and a minimum flow rate of 8 gpm.

i. This filter may be a separate item or included as a package with the water softener.

3. Interior water system shall be composed of a softened water system and a hard water system.
    a. The hard water system shall bypass the filter, water softener, and tankless heater, and serve hose spigots only.
    b. The soft water system will serve all other fixtures.
    c. Differentiate between soft hot water, soft cold water, and un-softened water pipes using labels or different color pipe.
4. Interior water piping shall be ¾”
    a. PEX with crimp ring, crimp sleeve, or expansion fittings
    b. Copper with soldered connections
5. Disinfection: per Section 33 68 30
6. Testing:
    a. Use go/no-go gauges for applicable fittings.
    b. Pressure testing per section 22 10 00

H. Install interior electrical service in the building. This work includes installing a service entrance, service isolation and breaker panel, lighting and power circuits with multiple voltages and appropriate switches, safety interrupts, and all other appurtenances required to create a fully-functional building electrical system as shown on the electrical drawings.
    1. Interior main service panel shall have 200 amp capacity
    2. Circuits:
        a. Provide 240V service to locations indicated on drawings
        b. Provide 120V service

I. Install data communications service entrance and internal building wiring, with access points as indicated on the electrical drawings.

J. Finished Surfaces:
    1. Provide finished surfaces as indicated on the drawings.
    2. Submittals:
        a. Provide color samples for interior finish paint. Owner will provide general color scheme.
        b. Provide color samples for stained concrete flooring. Owner will provide general color scheme.
        c. Provide color samples for rubber base cove trim. Owner will provide general color scheme.

3. Subject to compliance with other requirements, provide low VOC paint from one of the following:
    a. Sherwin Williams
    b. Benjamin Moore
    c. Or approved equal

K. Exterior Surfacing. Review Sections 32 15 00 and 32 92 19
1. Add indicated quantity of aggregate rock to driving surfaces.
2. Planting Season:
    a. If seeding between November and February, provide the following native high diversity seed mix: Miller Seed Mix #1 with wheat and/or oats mixed in as cover crop.
    b. If seeding between March and August, provide wheat and/or oats as a cover crop.
3. If seeding over compacted backfill is necessary where no salvaged topsoil is available, use an organic fertilizer. No fertilizer shall be used where salvaged topsoil is present.
4. Spread seeds over indicated areas according to the supplier's recommendations and apply mulch immediately after seeding.

L. Access Control
1. Provide the owner with keypad door hardware compatible with the installed doors for installation after construction.
    a. Suitable for exterior installation: 1 set
    b. Suitable for interior installation: 2 sets
2. At closeout, provide the owner with all construction access keys.

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. Engineer will 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 03 30 00

CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1. SECTION INCLUDES

A. Concrete formwork

B. Floors and slabs on grade

C. Concrete foundation walls

D. Elevated concrete slabs

E. Concrete reinforcement

F. Joint devices associated with concrete work

G. Miscellaneous concrete elements, including equipment pads, light pole bases, thrust blocks and manholes

H. Concrete curing

1.01 REFERENCES

I. ACI 211.1 – Standard Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete

J. ACI 301 – Specifications for Structural Concrete for Buildings

K. ACI 302.1R – Guide for Concrete Floor and Slab Construction

L. ACI 304R – Guide for Measuring, Mixing, Transporting, and Placing Concrete

M. ACI 305R – Hot Weather Concreting

N. ACI 306R – Cold Weather Concreting

O. ACI 309R – 05 Guide to Consolidation of Concrete

P. ACI 315 – Standard Practice for Detailing Reinforced Concrete Structures

Q. ACI 351 – Grouting Between Foundations and Bases for Support of Equipment and Machinery

R. ASTM C 33 – Standard Specification for Concrete Aggregates

S. ASTM C 39 – Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens

T. ASTM C 94 – Standard Specification for Ready-Mixed Concrete

U. ASTM C 143 – Standard Test Method for Slump of Hydraulic-Cement Concrete

V. ASTM C 150 – Specification for Portland Cement

W. ASTM C 171 – Standard Specification for Sheet Materials for Curing Concrete

X. ASTM C 173 – Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method

Y. ASTM A 185 – Standard Specification for Steel Welded Wire Reinforcement, Plain, for Concrete (Withdrawn 2013)

Z. ASTM C 260 – Standard Specification for Air-Entraining Admixtures for Concrete

AA. ASTM C 309 – Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete

BB. ASTM C 311 – Standard Test Methods for Sampling and Testing Fly Ash or Natural Pozzolans for Use in Portland - Cement Concrete

CC. ASTM C 494 – Standard Specification for Chemical Admixtures for Concrete

DD. ASTM A 497 – Standard Specification for Steel Welded Wire Reinforcement, Deformed, for Concrete (Withdrawn 2013)

EE. ASTM A 615 – Standard Specification for Deformed and Carbon-Steel Bars for Concrete Reinforcement

FF. ASTM C 618 –- Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete

GG. ASTM C 920 – Standard Specification for Elastomeric Joint Sealants

HH. ASTM C 1017 – Standard Specification for Chemical Admixtures for Use in Producing Flowing Concrete

II. ASTM C 1074 – Standard Practice for Estimating Concrete Strength by the Maturity Method

JJ. ASTM C 1077 – Standard Practice for Agencies Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Testing Agency Evaluation

KK. ASTM C 1116 – Standard Specification for Fiber-Reinforced Concrete

LL. ASTM D 3405 – Standard Specification for Joint Sealants, Hot-Applied for Concrete and Asphalt Pavements (Withdrawn 2002)

MM. ASTM E 329 – Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection

NN. ASTM E 548 – Standard Guide for General Criteria Used for Evaluating Laboratory Competence

OO. ASTM E 1643 – Standard Practice for Selection, Design, Installation, and Inspection of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs

PP. AASHTO M 33 – Standard Specification for Preformed Expansion Joint Filler for Concrete (Bituminous Type)

QQ. AASHTO M 182 – Standard Specification for Burlap Cloth Made from Jute or Kenaf and Cotton Mats

RR. State Standard Specifications for Highway Construction, Latest Addition, including all current supplemental specifications

SS. NSF 61 – Drinking Water System Components - Health Effects

1.02 UNIT PRICES

A. Concrete - Slab on Grade or Vertical in Forms or Miscellaneous Locations:

1. Includes formwork, reinforcement, concrete, placement accessories, consolidating and leveling, troweling and curing.

2. Method of measurement and pay unit by the cubic yard, square yard, as shown on the Bid Form, or as described in the Special Provisions Section 01 10 00.

3. Components and accessories are subsidiary items to placing concrete.

1.03 SUBMITTALS

A. Product Data: Submit manufacturer's data on manufactured material and products indicated.

B. Ready-mix delivery tickets: All tickets shall be recorded by the contractor and correlated to any on-site testing required by the Engineer.

C. Design Mixes:

1. Submit the proposed mix design for each class of concrete to Engineer and testing firm for review prior to commencement of concrete operations.

2. Specify amounts of mix water to be withheld for later addition at project site, if any.

3. Provide the source, type, name, and amount of each admixture in the design mix.

D. Material Certificates: Signed by manufacturers certifying that each of the following items complies with requirements:

1. Cementitious materials and aggregates.

2. Steel reinforcement and reinforcement accessories.

3. Admixtures.

E. Shop Drawings - Steel Reinforcement: Details of fabrication, bending and placement prepared according to ACI 315.

1. Included material, grade, bar schedules, stirrup spacing, bent bar diagrams, arrangement and supports of concrete reinforcement.

2. Include special reinforcement required for openings through concrete structures.

F. Project Record Documents: Accurately record locations of embedded utilities and components that will be concealed from view upon completion of concrete work.

1.2. QUALITY ASSURANCE

A. Installer Qualifications: An experienced installer who has completed concrete work similar in material, design and extent to that indicated for this project and whose work has resulted in construction with a record of successful in-service performance.

B. Concrete Supplier’s Qualifications: Firm experienced in manufacturing ready-mixed concrete products complying with ASTM C 94 requirements for production facilities and equipment.

1. Concrete Suppliers must be certified according to the National Ready Mixed Concrete Association Certification of Ready Mixed Concrete Production Facilities.

C. Testing Agency Qualifications: Independent testing agency, acceptable to authorities having jurisdiction, qualified according to ASTM C 1077 and ASTM E 329 to conduct testing indicated, as documented according to ASTM E 548.

1. Personnel conducting tests shall be qualified as ACI concrete field testing technician, Grade 1, according to ACI CP-1 or an equivalent certification program.

D. Obtain each type or class of cementitious material of the same brand from the same source, aggregate from same source and each admixture from same source.

PART 2 - PRODUCTS

2.1. FORMWORK

A. Form Materials: Contractor's choice of standard products with sufficient strength to withstand hydrostatic head without distortion greater than permitted tolerances.

1. Smooth-Formed Finished Concrete: Form-facing panels that will provide continuous, true and smooth concrete surfaces. Furnish in largest practical sizes to minimize number of joints.

a. Plywood, metal or other approved panel materials.

b. Use of aluminum forms is prohibited.

2. Rough-Formed Finished Concrete: Plywood, lumber, metal or other approved material. Provide dressed lumber on at least 2 edges and 1 side for tight fit. Use of aluminum forms is prohibited.

3. Forms for Cylindrical Columns, Pedestals, and Supports: Metal, glass-fiber reinforced plastic, paper or fiber tubes that will produce surfaces that meet specified formwork surface class. Use of aluminum forms is prohibited. Provide units with sufficient wall thickness to resist plastic concrete loads without detrimental deformation.

4. Chamfer Strips: Wood, metal, PVC or rubber strips 3/4 inch by 3/4 inch minimum.
5. Form Coating: Commercially formulated release agent that will not bond, stain or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces.
    a. For steel forms, formulate form-release agent with rust inhibitor.
6. Form Ties: Cone snap type that will leave no metal within 1 1/2 inches of concrete surface. Form ties with a waterstop shall be used for any structure that its intended purpose is to hold a liquid (i.e. water, wastewater, swimming pools, etc.).

2.2. REINFORCEMENT

A. Reinforcing Steel:
    1. ASTM A 615 Grade 60
        a. New, deformed billet-steel bars.
        b. Unfinished.

B. Plain-Steel Welded Wire reinforcement:
    1. ASTM A 185, plain, fabricated from as-drawn steel wire into flat sheets.
        a. Rolled sheets are not permitted.

C. Deformed-Steel Welded Wire Reinforcement:
    1. ASTM A 497, flat sheet
        a. Rolled sheets are not permitted.

D. Dowel Bars:
    1. ASTM A 615 Grade 60.
        a. New, smooth round steel bars.
        b. Coated with organic coating AASHTO M 254, corrosion resistant coated dowel bars.
    2. Cut bars true to length with ends square and free of burrs.

E. Reinforcement Accessories:
    1. Tie Wire: Annealed, minimum 16 gauge.
    2. Chairs, Bar Supports, Bolsters, Spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire reinforcement in place shall comply with CRSI's "Manual of Standard Practice’.
    3. Chairs, Bar Supports, Bolsters, Spacers, and other devices for spacing: Sized and shaped for adequate support of reinforcement during concrete placement.

2.3. CONCRETE MATERIALS

A. Concrete Materials:

1. Concrete shall consist of aggregate, portland cement, water, approved air-entraining and other admixtures and pozzolans.

B. Cement:

1. Type I, Type II, Type I/II and Type III Portland cement shall conform to the requirements in ASTM C 150 with the following additional requirements:

    a. Portland cement shall not contain more than 0.60 percent equivalent alkali.

    b. Processing additions may be used in the manufacture of the cement, provided such materials have been shown to meet the requirements of ASTM C 465 and the total amount does not exceed 1 percent of the weight of Portland cement clinker.

2. Interground and Blended Cement shall conform to the requirements in ASTM C 595 with the following additional requirements:

    a. Interground/Blended cement Type IP

        i. Type IP(25) shall be composed of Class F fly ash or Class N pozzolan replacement shall be 25%+/-2%

        ii. Type IP(20) shall be composed of Class F fly ash or Class N pozzolan replacement shall be 20%+/-2%

    b. Interground/Blended cement Type IT

        i. For SCMs, slag cement and limestone, the maximum replacement by weight shall be 40%. The manufacturer has a production tolerance of +2% from the proposed replacement.

        ii. For slag cement, the maximum replacement shall be 20% or less when incorporated into the final Interground/Blended cement.

        iii. For limestone cement, the replacement range shall be from 5.1% to 10.0% when incorporated into the final Interground/Blended cement.

C. Normal weight Fine and Coarse Mix Aggregate:

1. Mineral aggregates shall be crushed rock, broken stone, gravel, sand-gravel, coarse sand, fine sand, or a mixture of these materials composed of clean, hard, durable, and uncoated particles.

2. Shall meet the requirements in ASTM C 33.

3. Aggregates shall be free from injurious quantities of dust, soft or flaky particles, loams, alkali, organic matter, paper, wood, or other deleterious matter as determined by Engineer.

4. Free of materials with deleterious reactivity to alkali in cement.

D. Fly Ash: Shall meet the requirements in Class F; ASTM C 618 and ASTM C 311.

1. The use of Class C Fly ash is not acceptable in any concrete on this project.

E. Water:

1. Shall meet the requirements in ASTM C 94 and potable.

2. Water shall be free from objectionable quantities of oil, acid, alkali, salt, organic matter, or other deleterious materials.

2.4. ADMIXTURES

A. Contractor shall report the source, type, name, and amount of each admixture.

B. Air-Entrainment Admixture:

1. Shall meet the requirements in ASTM C 260;

2. For concrete that requires shrinkage reducing admixture, ensure that the air entrainment admixture that meets the shrinkage reducing admixture's manufacturer's requirements is utilized.

C. Plasticizing and Retarding Admixture: Shall meet the requirements in ASTM C 1017.

D. Other Chemical Admixtures:

1. Refer to approved products list in the applicable State or Local Standard Specifications or as specified in Section 01 10 00 - Special Provisions.

2. Admixtures shall meet the requirements in ASTM C 494.

3. Do not use chemicals that will result in soluble chloride ions in excess of 0.1 percent by weight of concrete.

4. Admixture shall not contain more than 1 percent of chlorides calculated as calcium chloride.

2.5. CONCRETE ACCESSORIES

A. Vapor Retarder: 10 mil thick nonwoven, polyester-reinforced, polyethylene coated sheet, type recommended for below grade application.

B. Water Stops:

1. Corps of Engineers (COE) CRD-C 572 and ASTM Standards

2. PVC type

3. Factory fabricated corners, intersections and directional changes.

4. Profile: Flat, ribbed with center bulb.

5. Size: 4", unless specified differently on the Plans or Special Provisions.

6. Pre-approved Manufacturers:

a. Sika Greenstreak

b. Progress Unlimited, Inc.

c. Sika Westec Barrier Technologies

d. Williams Products, Inc.

e. Approved Equivalent

C. Joint Filler: Preformed, non-extruding, bituminous type, AASHTO M 33.

D. Joint Sealer: Asphaltic, hot poured, ASTM D 3405.

1. Application: Use for joints in vehicular traffic areas.

E. Joint Sealer: Polyurethane, self-leveling; ASTM C 920, Class 25, (Uses - T, I, M and A), Type S - single component.

1. Color: Gray.

2. Applications: Use for joints in pedestrian walkways.

2.6. CURING MATERIALS

A. Evaporation Retarder: Waterborne, monomolecular film forming, manufactured for application to fresh concrete.

B. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz/sq yd dry.

C. Moisture-Retaining Cover: ASTM C 171; clear polyethylene or white burlap-polyethylene sheet.

D. Water: Potable.

E. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B.

F. Liquid Membrane-Forming Compounds for Curing Concrete: White pigmented, AASHTO M 148, Type 2.

2.7. CONCRETE MIX DESIGN

A. Specific mix design criteria for project components as stated in Section 01 10 00 – Special Provisions.

B. For trial mixtures method, employ independent testing agency acceptable to Engineer for preparing and reporting proposed mix designs.

C. Admixtures: Add acceptable admixtures as recommended in ACI 211 and at rates recommended by manufacturer.

1. Use water-reducing admixture or high-range water-reducing admixture (superplasticizers) in concrete, as required, for placement and workability.

2. Use water-reducing and retarding admixture when required by high temperatures, low humidity or other adverse placement conditions.

D. Non-Shrink Grout:

1. 6 sack grout, with the following quantities:

a. Cement: Type I, 2.87 cubic feet

b. Sand: Masonry sand, 17.97 cubic feet

c. 6% entrained air

d. Water: 4.54 cubic feet

e. POZZ 900 oz./100 admixture, 12 per mix

f. Water-Cementitious Ratio: 0.502 at SSD aggregate moisture

g. Unit Weight: 140.20 lbs./cf

E. Maximum Water-Cementitious Materials Ratio: As specified by the applicable State or Local Standard Specifications or as specified in Section 01 10 00 - Special Provisions.

F. Air Content: As specified by the applicable State or Local Standard Specifications or as specified in Section 01 10 00 - Special Provisions.

2.8. MIXING

A. Ready-Mixed Concrete: Measure, batch, mix and deliver concrete according to ASTM C 94 and ASTM C 1116 and furnish batch ticket information.

1. When air temperature is between 85 and 90 °F, reduce mixing and delivery time from 1 1/2 hours to 75 minutes. When air temperature is above 90 °F, reduce mixing and delivery time to 60 minutes.

PART 3 - EXECUTION

3.1. EXAMINATION

A. Verify lines, levels and dimensions before proceeding with work of this section.

B. Verify compacted subgrade is acceptable and ready to support footings, slabs and any other imposed loads.

3.2. PREPARATION

A. Notify Engineer a minimum of 48 hours prior to commencement of concreting operations.

B. Formwork: Comply with requirements of ACI 301. Design and fabricate forms to support all applied loads until concrete is cured.

1. Set edge forms, bulkheads and intermediate screed strips for slabs to achieve required alignment, elevation and slope in finished concrete surfaces. Provide

and secure units to support screed strips; use strike-off templates or compacting-type screeds.

2. Chamfer exterior corners and edges of permanently exposed concrete.
3. Clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt and other debris just before placing concrete.
4. Retighten forms and bracing before placing concrete, as required, to prevent mortar leaks and maintain proper alignment.
5. Verify that forms are clean and free of rust before applying release agent. Coat contact surfaces of forms with form-releasing agent, according to manufacturer's directions, before placing reinforcement.
6. Use of excavated earth back form shall not be permitted unless approved by Engineer. All structural walls shall be formed with form panels.

C. Removing and Reusing Forms:

1. Fabricate and assemble formwork to permit easy stripping and dismantling without damage to concrete. Forms shall be easily removed without hammering or prying against concrete surfaces. Provide crush or wrecking plates where stripping may damage cast concrete surfaces. Provide top forms for inclined surfaces steeper than 1.5 horizontal to 1 vertical. Kerf wood inserts for forming keyways, reglets, recesses and the like for easy removal.
2. Formwork for sides of beams, walls, columns and similar parts of the work that does not support weight of concrete may be removed after cumulatively curing at not less than 50 degrees F for 24 hours after placing concrete, provided concrete is hard enough to prevent damage by form removal operations, concrete has adequate strength to maintain structural integrity of the work and curing and protection operations are maintained.
3. Leave formwork for beam soffits, joists, slabs and other structural elements that support weight of concrete in place until concrete has achieved at least 70 percent of 28-day design compressive strength.
4. Clean and repair surfaces of forms to be reused in the work. Split, frayed, delaminated or otherwise damaged form-facing material is not acceptable for exposed surfaces. Apply new form-release agent.
5. When forms are reused, clean surfaces, remove fins and laitance, and tighten to close joints. Align and secure joints to avoid offsets. Do not use patched forms on exposed concrete surfaces unless approved by Engineer.

D. Embedded Items:

1. Place and secure anchorage devices and other embedded items required for adjoining work that is attached to or supported by cast-in-place concrete. Use setting drawings, templates, diagrams, instructions and directions furnished with items to be embedded.

a. Install anchor bolts, accurately located, to elevations required.

E. Coordinate placement of joint devices with erection of concrete formwork and placement of form accessories.

F. Vapor Retarder Under Interior Slabs on Grade:

1. Place, protect and repair vapor-retarder sheets according to ASTM E 1643 and manufacturer's instructions.

3.3. REINFORCEMENT

A. Delivery, Storage and Handling

1. Deliver, store and handle steel reinforcement to prevent bending and damage. Avoid damaging coatings on steel reinforcement.

B. Comply with requirements of ACI 301. Clean reinforcement of loose rust and mill scale and accurately position, support and secure in place to achieve not less than minimum concrete coverage required for protection.

1. Do not cut or puncture vapor retarder. Repair damage and reseal vapor retarder before placing concrete.

C. Accurately position, support and secure reinforcement against displacement. Locate and support reinforcement with bar supports to maintain minimum concrete cover. Do not tack weld crossing reinforcing bars.

D. Tying Reinforcement:

1. Tie reinforcing bars securely in place at all points where bars cross other reinforcing bars.

2. Set wire ties with ends directed into concrete, not toward exposed concrete surfaces.

E. Install welded wire reinforcement in longest practical length on bar supports spaced to minimize sagging. Lap edges and ends of adjoining sheets at least 1 mesh spacing. Offset laps of adjoining sheet widths to prevent continuous laps in either direction. Splice laps with tie wire.

F. Verify that anchors, seats, plates, reinforcement and other items to be cast into concrete are accurately placed, positioned securely and will not interfere with concrete placement.

G. Welding on reinforcing steel is prohibited unless specifically authorized by Engineer.

3.4. JOINT PLACEMENT

A. Construct joints true to line with faces perpendicular to surface plane of concrete.

B. Construction Joints: Install so strength and appearance of concrete are not impaired at locations indicated or as approved by Engineer.

1. Place joints perpendicular to main reinforcement. Continue reinforcement across construction joints unless otherwise indicated. Do not continue reinforcement through sides of strip placements of floors and slabs.
2. Form with preformed galvanized steel, plastic keyway-section forms or bulkhead forms with keys unless otherwise indicated. Embed keys at least 1 1/2 inches into concrete.
3. Locate joints for beams, slabs, joists and girders in the middle third of span. Offset joints in girders a minimum distance of twice the beam width from beam-girder intersection.
4. Locate horizontal joints in walls and columns at underside of floors, slabs, beams, girders and at top of footings or floor slabs.
5. Space vertical joints in walls as indicated. Locate joints beside piers integral with walls, near corners and in concealed locations where possible.
6. Use bonding agent at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.

C. Contraction Joints in Slabs-on-Grade. Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least 1/4 of concrete thickness as follows:

1. Grooved Joints: Form contraction joints after initial floating by grooving and finishing each edge of joint to a radius of 1/8 inch. Repeat grooving of contraction joints after applying surface finishes. Eliminate tool marks on concrete surfaces.
2. Sawed Joints: Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch-wide joints into concrete when cutting action will not tear, abrade or otherwise damage surface and before concrete develops random contraction cracks.

D. Isolation Joints in Slabs-on-Grade: After removing formwork, install joint-filler strips at slab junctions with vertical surfaces, such as column pedestals, foundation walls, grade beams and other locations as indicated.

1. Extend joint filler strips full width and depth of joint, terminating flush with finished concrete surface unless otherwise indicated.
2. Terminate full-width joint-filler strips not less than 1/2 inch or more than 1 inch below finished concrete surface where joint sealants are indicated.
3. Install joint-filler strips in lengths as long as practical. Where more than one length is required, lace or clip sections together.

E. Dowel Joints: Install dowel sleeves and dowels or dowel bar and support assemblies at joints where indicated. Use dowel sleeves or lubricate or asphalt-coat 1/2 of dowel length to prevent concrete bonding to 1 side of joint.

F. Water Stops:

1. Flexible Water Stops: Install in construction joints as indicated to form a continuous diaphragm. Install in longest lengths practical. Support and protect exposed water stops during progress of work. Field fabricate joints in water stops according to manufacturer's instructions.

3.5. PLACING CONCRETE

A. Follow recommendations of ACI 306R when concreting during cold weather.

B. Follow recommendations of ACI 305R when concreting during hot weather.

C. Before placing concrete, verify that installation of formwork, reinforcement and embedded items are complete and required inspections have been performed.

D. Repair vapor retarder damaged during placement of concrete reinforcing. Repair with vapor retarder material; lap over damaged areas a minimum of 6 inches and seal watertight.

E. Install joint devices in accordance with manufacturer's instructions.

F. Ensure reinforcement, embedded parts and forms are not disturbed during concrete placement.

G. Do not add water to concrete during delivery, at project site or during placement unless approved by Engineer.

H. Deposit concrete continuously or in layers at such thickness that no concrete will be placed on concrete that has hardened enough to cause seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as specified. Deposit concrete to avoid segregation. Concrete free fall distance shall not exceed 5 feet. This includes free fall in a discharge pipe. Chutes and tremie pipes may be used for conveying concrete to the forms when authorized by Engineer.

I. Deposit concrete in forms in horizontal layers no deeper than 18 inches and in a manner to avoid inclined construction joints. Place each layer while preceding layer is still plastic to avoid cold joints.

   1. Consolidate placed concrete with mechanical vibrating equipment. Use equipment and procedures for consolidating concrete recommended by ACI 309R.

   2. Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations no farther than the visible effectiveness of the vibrator. Place vibrators to rapidly penetrate placed layers and at least 6 inches into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to lose plasticity. At each insertion, limit duration of vibration as necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing mix constituents to segregate.

J. Deposit and consolidate concrete for floors and slabs in continuous operation, within limits of construction joints, until placement of panel or section is complete.

1. Consolidate concrete during placement operations so concrete is thoroughly worked around reinforcement and other embedded items and into corners.
2. Maintain reinforcement in position on chairs during concrete placement.
3. Screed slab surfaces with a straightedge and strike off to correct elevations.
4. Slope surfaces uniformly to drains where required.
5. Begin initial floating using bull floats or darbies to form a uniform and open-texture surface plane, free of humps or hollows, before excess moisture or bleedwater appears on surface. Do not further disturb slab surfaces before starting finishing operations.

K. Pumping Concrete:

1. Pump concrete into forms in a continuous stream and free of air pockets. Eject concrete in the pipeline in such a manner that there will be no contamination or segregation of the concrete.
2. Use pump discharge pipes designed to maintain a positive pressure head on the concrete. Free fall distance shall not exceed 5 feet at discharge.
3. Perform air test, slump tests and fabrication of concrete test cylinders at the final discharge point.

L. Cold-Weather Placement: Comply with ACI 306.1 and as follows:

1. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions or low temperatures.
2. When air temperature has fallen to or is expected to fall below 40 degrees F, uniformly heat water and aggregates before mixing to obtain a concrete mixture temperature of not less than 50 degrees F and not more than 80 degrees F at point of placement.
3. Do not use frozen materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.
4. Do not use calcium chloride, salt or materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in mix designs.

M. Hot-Weather Placement: Comply with ACI 305R and as follows when hot weather conditions exist:

1. Cool ingredients before mixing to maintain concrete temperature below 90 degrees F at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated to total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor’s option.
2. Cover steel reinforcement with water-soaked burlap so steel temperature will not exceed ambient air temperature immediately before embedding in concrete.

3. Fog-spray forms, steel reinforcement and subgrade just before placing concrete. Keep subgrade moisture uniform without standing water, soft spots or dry areas.

N. Screed floors level, maintaining surface flatness of maximum 1/4 inch in 10 feet.

3.6. CONCRETE FINISHING

A. Repair surface defects, including tie holes, immediately after removing formwork.

B. Rough Form Finish: Rub down or chip off fins or other raised areas 1/4-inch or more in height.

C. Unexposed concrete shall use a Rough Form Finish.

D. Smooth Form Finish: Rub down or chip off and smooth fins or other raised areas 1/4 inch or more in height. Provide finish as follows:

1. Smooth Rubbed Finish: Wet concrete and rub with carborundum brick or other abrasive not more than 24 hours after form removal.

2. Grout Cleaned Finish: Wet areas to be cleaned and apply grout mixture by brush or spray; scrub immediately to remove excess grout. After drying, rub vigorously with clean burlap and keep moist for 36 hours.

3. Cork Floated Finish: Immediately after form removal, apply grout with trowel or firm rubber float, compress grout with low-speed grinder and apply final texture with cork float.

E. Concrete Floors and Slabs: Finish to requirements of ACI 302.1R and as follows:

1. Float Finish: Consolidate surface with power-driven floats or by hand floating if area is small or inaccessible to power-driven floats. Straighten, cut down high spots and fill low spots. Repeat float passes and straightening until surface is left with a uniform, smooth, granular texture.

a. Apply float finish to surfaces indicated, to surfaces to receive trowel finish, and to floor and slab surfaces to be covered with fluid-applied or sheet waterproofing, built-up membrane roofing or sand-bed terrazzo.

2. Trowel Finish: After applying float finish, apply first trowel finish and consolidate concrete by hand or power-driven trowel. Continue troweling passes and straighten until surface is free of trowel marks and uniform in texture and appearance. Grind smooth any surface defects that would telegraph through applied coatings or floor coverings.

a. Apply a trowel finish to surfaces indicated and to floor and slab surfaces exposed to view or to be covered with resilient flooring, carpet, ceramic, or quarry tile set over a cleavage membrane, paint or another thin-film finish coating system.

b. Finish and measure surface so gap at any point between concrete surface and an unleveled freestanding 10-foot-long straightedge, resting on 2 high spots and placed anywhere on the surface, does not exceed 1/4 inch.

3. Trowel and Fine-Broom Finish: Apply a partial trowel finish, stopping after second troweling, to surfaces indicated and to surfaces where ceramic or quarry tile is to be installed by either thick-set or thin-set method.

    a. Immediately after second troweling, and when concrete is still plastic, slightly scarify surface with fine broom.

4. Broom Finish: Apply a broom finish to exterior concrete platforms, steps, ramps and elsewhere as indicated.

    a. Immediately after float finishing, slightly roughen trafficked surface by brooming with fiber-bristle broom perpendicular to main traffic route. Coordinate required final finish with Engineer before application.

5. Burlap Drag Finish: Apply a burlap drag finish to paving, parking areas and elsewhere as indicated.

    a. Immediately after float finishing, texture by dragging a wet burlap, carpet or canvas belt over full width of surface in longitudinal direction.

    b. Suspend drag from mandrel or similar device to ensure uniform texture.

    c. Rinse or wash drags as necessary to obtain uniform texture.

    d. Replace drags which cannot be cleaned.

3.7. CURING AND PROTECTION

A. Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold weather protection and with recommendation in ACI 305R for hot weather protection during curing.

B. Evaporation Retarder: Apply evaporation retarder to unformed concrete surfaces if hot, dry or windy conditions cause moisture loss approaching 0.2 lb/sq ft per hour before and during finishing operations.

    1. If the rate of evaporation approaches 0.2 lb/sq ft per hour, Contractor must notify Engineer regarding the additional actions that will be taken to prevent plastic shrinkage cracking.

    2. Obtain rate of evaporation from applicable State or local Standard Specification.

C. Formed Surfaces: Cure formed concrete surfaces, including underside of beams, supported slabs and other similar surfaces. If forms remain during curing period, moist cure after loosening forms. If removing forms before end of curing period, continue curing by one or a combination of methods:

    1. Moisture Curing: Keep surfaces continuously moist for not less than 7 days with the following materials:

        a. Water.

        b. Continuous water-fog spray.

c. Absorptive cover, water saturated, and kept continuously wet. Cover concrete surfaces and edges with 12-inch lap over adjacent absorptive covers.

2. Moisture-Retaining Cover Curing: Cover concrete surfaces and sides with moisture-retaining cover for curing concrete, placed in widest practical width, lapped at least 12 inches and sealed with waterproof tape or adhesive. Cure for not less than 7 days. Immediately repair any holes or tears during curing period using cover material and waterproof tape.

   a. Moisture cure or use moisture-retaining covers to cure concrete surfaces to receive floor coverings.

   b. Moisture cure or use moisture-retaining covers to cure concrete surfaces to receive penetrating liquid floor treatments.

   c. Cure concrete surfaces to receive floor covering with either a moisture-retaining cover or a manufacturer recommended curing compound for use with floor coverings.

3. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's directions. Recoat areas subjected to heavy rainfall within 3 hours after initial application. Maintain continuity of coating and repair damage during curing period.

4. Curing and Sealing Compound: Apply uniformly to floors and slabs indicated in a continuous operation by power spray or roller according to manufacturer's directions. Recoat areas subjected to heavy rainfall within 3 hours after initial application. Repeat process 24 hours later and apply second coat. Maintain continuity of coating and repair damage during curing period.

D. Unformed Surfaces: Begin curing immediately after finishing concrete. Cure unformed surfaces, including floors and slabs, concrete floor toppings and other surfaces, by one of the methods listed above in formed surfaces.

3.8. JOINT FILLING

A. Prepare, clean and install joint filler according to manufacturer's directions.

B. Remove dirt, debris, saw cuttings, curing compounds and sealers from joints; leave contact faces of joint clean and dry.

C. Install semi-rigid epoxy joint filler depth in saw-cut joints and at least 2 inches into deep- formed joints. Overfill joint and trim joint filler flush with lip of joint after hardening.

3.9. FIELD QUALITY CONTROL

A. An independent testing agency employed by Owner shall perform field quality control tests as specified in Section 01 40 00 - Quality Requirements.

1. Contractor shall provide free access to concrete operations at project site and cooperate with testing agency.

2. Contractor shall submit proposed mix design of each class of concrete to Engineer and testing agency for review prior to commencement of concrete operations.
3. Results of testing shall be furnished in a timely manner to Owner, Engineer and Contractor, in writing.
4. Field testing and laboratory testing of concrete will be performed by testing agency employed by Owner to determine conformance with specified requirements.
5. Strength Testing:
    a. Compressive Strength Test Samples: ASTM C 39. For each test, mold and cure 3 concrete test cylinders. A set of 3 test cylinders shall be collected for every 100 cubic yard or fractional part thereof for each class of concrete placed in a day. At least one set of cylinders is required for each day concrete placement takes place.
        i. One additional cylinder may be required for a break prior to 7 days.
        ii. Take 1 additional test cylinder during cold weather concreting, cured on job site under same conditions as concrete it represents.
    b. Maturity Method for Estimating Strength: ASTM C 1074. The Contractor may elect to utilize the maturity curve method to determine concrete strength. The Contractor must notify the Engineer in writing and submit a Plan with any changes applicable with State or local standard specifications.
6. Perform 1 slump test for each set of test cylinders taken.
    a. If the concrete mixture is excessively wet causing segregation, excessive bleeding, or any other undesirable condition, the concrete shall be rejected.
    b. If the slump is outside the allowable limits specified in Section 01 10 00 - Special Provisions, the load of concrete shall be rejected.
7. Perform 1 air content test for each set of test cylinders taken.
    a. If the air content is less than the minimum specified, only one addition of air-entraining admixtures is allowed.
    b. If the air content is then outside the allowable limits specified in Section 01 10 00 - Special Provisions, the load of concrete shall be rejected.

B. The independent testing agency employed by Owner will maintain records of placed concrete items and Contractor shall assists testing agency as necessary to accomplish the completion of this record keeping. Records will include: type of test samples taken, all test results, date and location of sample collected, concrete test cylinder number, quantity of concrete placed and slump, air content, air temperature test results.

C. Additional Tests: The testing agency employed by Owner shall make additional tests of concrete, as directed by Engineer, when test results indicate that slump, air entrainment, compressive strengths or other requirements have not been met.

1. The cost for this additional testing will be paid for by Contractor.

2. If any additional testing is required to isolate failures, this shall be considered retests and shall be paid for by Contractor.

3.10. DEFECTIVE CONCRETE

A. All materials which Engineer determines to be damaged, defective, or otherwise unsuitable for use will be rejected and shall be removed and replaced at Contractor's expense.

Contractor will be required to take corrective measures for high spots or low areas by removal and replacement, or by grinding with a machine equipped with multiple diamond blades with spacers to the required profile. If grinding is used, utilize methods which do not break the cement and aggregate bond. Engineer will determine whether defective concrete will be repaired, or if it will be rejected and removed and replaced. Contractor shall submit the proposed corrective action plan and receive Engineer AND Owner approval prior to performing corrective measures. The approved corrective measure will be done at Contractor's expense.

B. Contractor will be required to take corrective measures for any cracking of concrete no matter what the cause. The corrective measures may include routing and sealing the cracks or removal and replacement. Engineer will determine whether defective concrete will be repaired, or if it will be rejected and removed and replaced. Contractor shall submit the proposed corrective action plan and receive Engineer AND Owner approval prior to performing corrective measures. The approved corrective measures will be done at Contractor's expense.

C. Joints: Contractor will be required to take corrective measures for any joints that in the opinion of Engineer are not constructed per the plans and specifications. Contractor shall submit the proposed corrective action plan and receive Engineer AND Owner approval prior to performing corrective measures. The approved corrective measures will be done at Contractor's expense.

D. Contractor will be required to take corrective measures for any concrete containing excessive honeycombing, spalling, fractures, chips and concrete that does not conform to required lines, details, dimensions, tolerances, specified requirements or other defects at no additional cost to Owner. The corrective measures may include repairing concrete or removal and replacement of concrete. Engineer will determine whether defective concrete will be repaired, or if it will be rejected and removed and replaced. Contractor shall submit the proposed corrective action plan and receive Engineer AND Owner approval prior to performing corrective measures. The approved corrective measures will be done at Contractor's expense.

E. Contractor must protect the concrete from damage due to rain, premature drying, excessive hot or cold temperatures, foot traffic and vehicular traffic. Failure to properly protect concrete may constitute cause for repairing or for removal and

replacement of defective concrete. Engineer will determine whether defective concrete shall be repaired, or if it shall be rejected and removed and replaced. Contractor shall submit the proposed corrective action plan to address the defective concrete and receive Engineer AND Owner approval prior to performing corrective measures. The approved corrective measures will be done at Contractor's expense.

F. The cost of any additional testing performed as a result of repairing or removal and replacement of defective concrete shall be borne by Contractor when defective concrete is identified.

3.11. TOLERANCES

A. Maximum Variation of Surface Flatness: 1/8 inch in 10 feet.

B. Maximum Variation from True Position: 1/4 inch.

C. All concrete shall meet or exceed the strength requirement of the specifications.

1. If concrete does not meet the minimum strength requirement, the Contractor may elect to further evaluate the use of the concrete in place. Evaluation shall be performed by the Engineer of record, at the Contractor's expense. .

2. Concrete not approved by the Engineer shall be rejected and shall be removed and replaced at Contractor's expense.

D. All concrete shall meet or exceed the minimum thickness as per the plans and specifications.

1. If concrete does not meet the minimum thickness requirement, the Contractor may elect to further evaluate the use of the concrete in place. Evaluation shall be performed by the Engineer of record, at the Contractor's expense.

2. Concrete not approved by the Engineer shall be rejected and shall be removed and replaced at Contractor's expense.

END OF SECTION

SECTION 06 10 00
ROUGH CARPENTRY

PART 1 - GENERAL

1.1. DESCRIPTION:

A. This section specifies wood blocking, framing, sheathing, furring, nailers, sub-flooring, rough hardware, and light wood construction.

1.2. RELATED WORK:

A. Gypsum sheathing: Section 09 20 00, PLASTER AND GYPSUM BOARD.

1.3. SUBMITTALS:

A. Submit in accordance with Section 01 10 00, SPECIAL PROVISIONS

B. Manufacturer's Literature and Data:

1. Submit data for fire retardant treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Include physical properties of treated materials based on testing by a qualified independent testing agency.

1.4. PRODUCT DELIVERY, STORAGE AND HANDLING:

A. Protect lumber and other products from dampness both during and after delivery at site.

B. Pile lumber in stacks in such manner as to provide air circulation around surfaces of each piece.

C. Stack plywood and other board products so as to prevent warping.

D. Locate stacks on well drained areas, supported at least 6 inches above grade and cover to protect lumber from driving rain.

1.5. QUALITY ASSURANCE:

A. Installer: A firm with a minimum of three (3) years' experience in the type of work required by this section.

1.6. APPLICABLE PUBLICATIONS:

A. Publications listed below form a part of this specification to extent referenced. Publications are referenced in the text by basic designation only.

B. American Forest and Paper Association (AFPA):

NDS-15 ----------National Design Specification for Wood Construction

WCD1-01----------Details for Conventional Wood Frame Construction

C. American Institute of Timber Construction (AITC):

A190.1-07 ----------Structural Glued Laminated Timber

D. American Society of Mechanical Engineers (ASME):

B18.2.1-12(R2013) --------Square and Hex Bolts and Screws

B18.2.2-10 ----------Square and Hex Nuts

B18.6.1-81(R2008) --------Wood Screws

E. American Plywood Association (APA):

E30-11 ----------Engineered Wood Construction Guide

F. ASTM International (ASTM):

C1002-14----------Steel Self-Piercing Tapping Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Metal Studs

D198-14 ----------Test Methods of Static Tests of Lumber in Structural Sizes

D2344/D2344M-13---------Test Method for Short-Beam Strength of Polymer Matrix Composite Materials and Their Laminates

D2559-12a ----------Adhesives for Structural Laminated Wood Products for Use Under Exterior (Wet Use) Exposure Conditions

D3498-03(R2011)----------Adhesives for Field-Gluing Plywood to Lumber Framing for Floor Systems

D6111-13a ----------Test Method for Bulk Density and Specific Gravity of Plastic Lumber and Shapes by Displacement

F844-07a(R2013) ----------Washers, Steel, Plan (Flat) Unhardened for General Use

F1667-13 ----------Nails, Spikes, and Staples

G. American Wood Protection Association (AWPA):

AWPA Book of Standards

H. Commercial Item Description (CID):

A-A-55615----------Shield, Expansion (Wood Screw and Lag Bolt Self Threading Anchors)

I. Forest Stewardship Council (FSC):

FSC-STD-01-001(Ver. 4-0)FSC Principles and Criteria for Forest Stewardship

J. Military Specification (Mil. Spec.):

MIL-L-19140E----------Lumber and Plywood, Fire-Retardant Treated

K. Environmental Protection Agency (EPA):

40 CFR 59(2014)----------National Volatile Organic Compound Emission Standards for Consumer and Commercial Products

L. U.S. Department of Commerce Product Standard (PS)

PS 1-95 ----------Construction and Industrial Plywood

PS 20-10 ----------American Softwood Lumber Standard

M. ICC Evaluation Service (ICC ES):

AC174----------Deck Board Span Ratings and Guardrail Systems (Guards and Handrails)

PART 2 - PRODUCTS

2.1. LUMBER:

A. Unless otherwise specified, each piece of lumber must bear grade mark, stamp, or other identifying marks indicating grades of material, and rules or standards under which produced.

1. Identifying marks are to be in accordance with rule or standard under which material is produced, including requirements for qualifications and authority of the inspection organization, usage of authorized identification, and information included in the identification.

2. Inspection agency for lumber approved by the Board of Review, American Lumber Standards Committee, to grade species used.

B. Joist Lumber: Species and grade as listed in the AFPA NDS having design stresses as shown.

C. Lumber Other Than Structural:

1. Unless otherwise specified, species graded under the grading rules of an inspection agency approved by Board of Review, American Lumber Standards Committee.

2. Framing lumber: Minimum extreme fiber stress in bending of 7584 kPa (1100 PSI).

3. Furring, blocking, nailers and similar items 4 inches and narrower Standard Grade; and, members 6 inches and wider, Number 2 Grade.

D. Sizes:

1. Conforming to PS 20.

2. Size references are nominal sizes, unless otherwise specified, actual sizes within manufacturing tolerances allowed by standard under which produced.

E. Moisture Content:

1. Maximum moisture content of wood products is to be as follows at the time of delivery to site.

a. Boards and lumber 2 inches and less in thickness: 19 percent or less.

b. Lumber over 2 inches thick: 25 percent or less.

F. Fire Retardant Treatment:

1. Comply with Mil Spec. MIL-L-19140.

2. Treatment and performance inspection, by an independent and qualified testing agency that establishes performance ratings.

G. Preservative Treatment:

1. Do not treat Heart Redwood and Western Red Cedar.

2. Treat wood members and plywood exposed to weather or in contact with plaster, masonry or concrete, including framing of open roofed structures; sills, sole plates, furring, and sleepers that are less than 24 inches from ground; nailers, edge strips, blocking, crickets, curbs, cant, vent strips and other members provided in connection with roofing and flashing materials.

3. Treat other members specified as preservative treated (PT).

4. Preservative treat by the pressure method complying with AWPA Book use category system standards U1 and T1, except any process involving the use of Chromated Copper Arsenate (CCA) or other agents classified as carcinogenic for

2.2. PLYWOOD:

A. Comply with PS 1.

B. Bear the mark of a recognized association or independent inspection agency that maintains continuing control over quality of plywood which identifies compliance by veneer grade, group number, span rating where applicable, and glue type.

2.3. ROUGH HARDWARE AND ADHESIVES:

A. Anchor Bolts. Unless noted otherwise by the building manufacturer:

1. ASME B18.2.1 and ASME B18.2.2 galvanized, 1/2 inch unless shown otherwise.

2. Extend at least 8 inches into masonry or concrete with ends bent 2 inches.

B. Miscellaneous Bolts: Expansion Bolts: C1D A-A-55615; lag bolt, long enough to extend at least 2-1/2 inches into masonry or concrete. Provide 1/2 inch bolt unless shown otherwise.

C. Washers

1. ASTM F844.

2. Provide zinc or cadmium coated steel or cast iron for washers exposed to weather.

D. Screws:

1. Wood to Wood: ASME B18.6.1 or ASTM C1002.

2. Wood to Steel: ASTM C954, or ASTM C1002.

E. Nails:

1. Size and type best suited for purpose unless noted otherwise. Provide aluminum-alloy nails, plated nails, or zinc-coated nails, for nailing wood work exposed to weather and on roof blocking.

2. ASTM F1667:

a. Common: Type I, Style 10.

b. Concrete: Type I, Style 11.

c. Barbed: Type I, Style 26.

d. Underlayment: Type I, Style 25.

e. Masonry: Type I, Style 27.

f. Provide special nails designed for use with ties, strap anchors, framing connectors, joists hangers, and similar items. Nails not less than 1-1/4 inches long, 8d and deformed or annular ring shank.

F. Framing and Timber Connectors:

1. Fabricate of ASTM A653/A653M, Grade A; steel sheet not less than 0.052 inch thick unless specified otherwise. Apply standard plating to steel timber connectors after punching, forming and assembly of parts.

2. Framing Angles: Angle designed with bendable legs to provide three (3) way anchors.

3. Straps:

a. Designed to provide wind and seismic ties with sizes as shown or specified.

b. Strap ties not less than 1-1/4 inches wide.

c. Punched for fastener.

PART 3 - EXECUTION

3.1. INSTALLATION OF FRAMING AND MISCELLANEOUS WOOD MEMBERS:

A. Conform to applicable requirements of the following:

1. AFPA WCD1 for nailing and framing unless specified otherwise.

2. APA for installation of plywood or structural use panels.

B. Fasteners:

1. Nails.

a. Select nail size and nail spacing sufficient to develop adequate strength for the connection without splitting the members.

b. Use special nails with framing connectors.

c. For sheathing and subflooring, select length of nails sufficient to extend 1 inch into supports.

d. Use 8d or larger nails for nailing through 1 inch thick lumber and for toe nailing 2 inch thick lumber.

e. Use 16d or larger nails for nailing through 2 inch thick lumber.

f. Select the size and number of nails in accordance with the Nailing Schedule except for special nails with framing anchors.

g. Nailing Schedule; Using Common Nails:

    i. Joist bearing on sill or girder, toe nail three (3) 8d nails or framing anchor.

    ii. Bridging to joist, toe nail each end two (2) 8d nails.

    iii. Ledger strip to beam or girder three (3) 16d nails under each joint.

    iv. Subflooring or Sheathing:

        1. 6 inch wide or less to each joist face nail two (2) 8d nails.

        2. Subflooring, more than 6 inches wide, to each stud or joint, face nail three (3) 8d nails.

        3. Plywood or structural use panel to each stud or joist face nail 8d, at supported edges 6 inches on center and at intermediate supports 10 inches on center. When gluing plywood to joint framing increase nail spacing to 12 inches at supported edges and 20 inches o.c. at intermediate supports.

    v. Sole plate to joist or blocking, through sub floor face nail 20d nails, 16 inches on center.

    vi. Top plate to stud, end nail two (2) 16d nails.

    vii. Stud to sole plate, toe nail or framing anchor. Four (4) 8d nails.

    viii. Doubled studs, face nail 16d at 24 inches on center.

    ix. Built-up corner studs 16d at 24 inches on center.

    x. Doubled top plates, face nails 16d at 16 inches on center.

    xi. Top plates, laps, and intersections, face nail two (2) 16d.

    xii. Continuous header, two pieces 16d at 16 inches on center along each edge.

    xiii. Ceiling joists to plate, toenail three (3) 8d or framing anchor.

    xiv. Continuous header to stud, four (4) 16d.

xv. Ceiling joists, laps over partitions, face nail three (3) 16d or framing anchor.

xvi. Ceiling joists, to parallel rafters, face nail three (3) 16d.

2. Bolts:

   a. Fit bolt heads and nuts bearing on wood with washers.

   b. Countersink bolt heads flush with the surface of nailers.

   c. Embed in concrete and solid masonry or provide expansion bolts. Special bolts or screws designed for anchor to solid masonry or concrete in drilled holes may be used.

   d. Provide toggle bolts to hollow masonry or sheet metal.

3. Power actuated drive pins may be provided where practical to anchor to solid masonry, concrete, or steel.

4. Do not anchor to wood plugs or nailing blocks in masonry or concrete. Provide metal plugs, inserts or similar fastening.

5. Screws to Join Wood:

   a. Where shown or option to nails.

   b. ASTM C1002, sized to provide not less than 1 inch penetration into anchorage member.

   c. Spaced same as nails.

6. Installation of Timber Connectors:

   a. Conform to applicable requirements of the AFPA NDS.

   b. Fit wood to connectors and drill holes for fasteners so wood is not split.

C. Set sills or plates level in full bed of mortar on masonry or concrete walls.

1. Space anchor bolts 4 feet on centers between ends and within 6 inches of end. Stagger bolts from side to side on plates over 7 inches in width.

2. Provide shims of slate, tile or similar approved material to level wood members resting on concrete or masonry. Do not use wood shims or wedges.

3. Closely fit, and set to required lines.

D. Cut notch, or bore in accordance with AFPA WCD1 passage of ducts wires, bolts, pipes, conduits and to accommodate other work. Repair or replace miscut, misfit or damaged work.

E. Blocking Nailers, and Furring:

1. Install furring, blocking, nailers, and grounds where shown.

2. Provide longest lengths practicable.

3. Provide fire retardant treated wood blocking where shown at openings and where shown or specified.
4. Layers of Blocking or Plates:
    a. Stagger end joints between upper and lower pieces.
    b. Nail at ends and not over 24 inches between ends.
    c. Stagger nails from side to side of wood member over 5 inches in width.

F. Floor and Ceiling Framing:

1. Set with crown edge up.
2. Keep framing at least 2 inches away from chimneys.
3. Bear on not less than 4 inches on concrete and masonry, and 1-1/2 inches on wood and metal unless shown otherwise.
4. Support joist, trimmer joists, headers, and beams framing into carrying members at same relative levels on joist hangers unless shown otherwise.
5. Lap and spike wood joists together at bearing, or butt end-to-end with scab ties at joint and spike to plates. Scab tie lengths not less than 8 inches lap on joist ends. Install wood I beam joists as indicated in contract documents.
6. Frame openings with headers and trimmer joist. Double headers carrying more than two tail joists and trimmer joists supporting headers carrying more than one tail joist unless otherwise indicated in contract documents.
7. Drive nails through headers into joists using two (2) nails for 2 inch by 6 inch; three (3) nails for 2 inch by 8 inch and four (4) nails for 2 inch by 10 inch and over in size.
8. Install nearest joist to double headers and spike joist to both header members before trimmer joist is installed and secured together.
9. Doubled joists under partitions parallel with floor joists.
10. Anchor joists running parallel with masonry or concrete walls to walls with steel flats spaced not over 6 feet apart. Extend steel flats over at least three (3) joists and into masonry 4 inches with ends turned 2 inches; bolt to concrete. Set top of flats flush with top of joists, and securely nail steel flats to each joist.
11. Nonbearing partitions running parallel with ceiling joists, install solid 2 inch thick bridging same depth as ceiling joists cut to fit snug between joists for securing top plate of partitions. Securely spike bridging to joists. Space 4 feet on center.

G. Partition and Wall Framing:

1. Provide 2 inch by 4 inch studs spaced 16 inches on centers; unless otherwise indicated on contract documents.
2. Install double studs at openings and triple studs at corners.

3. Installation of sole plate:
    a. Anchor plates of walls or partitions resting on concrete floors in place with expansion bolts, one (1) near ends of piece and at intermediate intervals of not more than 4 feet or with power actuated drive pins with threaded ends of suitable type and size, spaced 2 feet on center unless shown otherwise.
    b. Nail plates to wood framing through subfloor as specified in nailing schedule.
4. Headers or Lintels:
    a. Make headers for openings of two (2) pieces of 2 inch thick lumber of size shown with plywood filler to finish flush with face of studs or solid lumber of equivalent size.
    b. Support ends of headers on top of stud cut for height of opening. Spike cut stud to adjacent stud. Spike adjacent stud to header.
5. Provide double top plates, with members lapped at least 2-feet spiked together.
6. Install intermediate cut studs over headers and under sills to maintain uniformity of stud spacing.
7. Provide single sill plates at bottom of opening unless otherwise indicated in contract documents. Toe nail to end stud, face nail to intermediate studs.
8. Install 2 inch blocking for firestopping so that maximum dimension of any concealed space is not over 8 feet in accordance with AFPA WCD1.
9. Install corner bracing when plywood or structured use panel sheathing is not used.
    a. Let corner bracing into exterior surfaces of studs at an angle of approximately 45 degrees, extended completely over walls plates, and secured at bearing with two (2) nails.
    b. Provide 1 inch by 4 inch corner bracing.

H. Rough Bucks:
1. Install rough wood bucks at opening in masonry or concrete where wood frames or trim occur.
2. Brace and maintain bucks plumb and true until masonry has been built around them or concrete cast in place.
3. Cut rough bucks from 2 inch thick stock, of same width as partitions in which they occur and of width shown in exterior walls.
4. Extend bucks full height of openings and across head of openings; fasten securely with anchors specified.

I. Subflooring:
1. Subflooring may be either boards, structural-use panels, or plywood.

2. Lay board subflooring diagonally, with close joints. Stagger end joints and make joints over supports. Bear each board on at least three supports.
3. Provide a clearance of approximately 1/2 inch at masonry or concrete at walls.
4. Apply plywood and structural-use panel subflooring with face grain or long dimension at right angles to the supports, with edges 1/4 inch apart at side joints, and 1/8 inch apart at end joints.
5. Combination subfloor-underlayment:
    a. Space edges 1/8 inch apart.
    b. Provide a clearance of 1/4 inch at masonry on concrete at walls.
6. Stagger panel end joints and make over support.

J. Underlayment:

1. Where finish flooring of different thickness is used in adjoining areas, provide underlayment of thickness required to bring finish-flooring surfaces into same plane.
2. Apply to dry, level, securely nailed, clean, wood subfloor without any projections.
3. Plywood and particle underlayment are to be glue-nailed to subfloor.
4. Butt underlayment panels to a light contact with a 1/32 inch space between plywood or hardboard underlayment panels and walls, and approximately 3/8 inch between particleboard underlayment panels and walls.
5. Stagger underlayment panel end joints with respect to each other and offset joints with respect to joints in the subfloor at least 2 inches.
6. After installation, avoid traffic on underlayment and damage to the finish surface.

END OF SECTION

SECTION 13 34 19

METAL BUILDING SYSTEMS

PART 1 - GENERAL

1.1. METAL BUILDING SYSTEM COMPONENTS

A. Clear span rigid frame

B. Roof Slope: as shown on drawings

C. Primary Framing: Rigid frame of rafter beams and columns

D. Secondary Framing: Purlins, girts, and other items detailed

E. Lateral Bracing: Horizontal loads not resisted by main frame action shall be resisted by cable or rod

F. Wall and Roof System: Preformed steel panels and accessory components.

G. Accessories: windows, doors

1.2. RELATED SECTIONS

A. Section 03 30 00: Concrete footings and floor slab

1.3. REFERENCES

A. AISI S100, North American Specification for the Design of Cold-Formed Steel Structural Members, Washington, D.C., 2007 (with Supplement No. 2 , dated 2010).

B. AISC 360, Specification for Structural Steel Buildings, American Institute of Steel Construction, Chicago, IL 2010.

C. ASTM A36-08, Standard "Specification for Carbon Structural Steel," West Conshohocken, PA.

D. ASTM A123-08, Standard "Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products, "West Conshohocken, PA.

E. ASTM A153-05, Standard "Specification for Zinc Coating (Hot Dip) on Iron and Steel Hardware," West Conshohocken, PA.

F. ASTM A307-07b, Standard "Specification for Carbon Steel Bolts and Studs, 60,000 psi Tensile Strength, " West Conshohocken, PA.

G. ASTM A32510, Standard "Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength," West Conshohocken, PA.

H. ASTM A463-06, Standard "Specification for Steel Sheet, Aluminum-Coated, by the Hot-Dip Process, West Conshohocken, PA, 2006.

I. ASTM A475-03(2009), Standard "Specification for Zinc-Coated Steel Wire Strand," West Conshohocken, PA,.

J. ASTM A49010a, Standard "Specification for Heat Treated Steel Structural Bolts, 150 ksi Minimum Tensile Strength," West Conshohocken, PA.

K. ASTM A50010, Standard "Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes," West Conshohocken, PA.

L. ASTM A529-05(2009), Standard "Specification for High-Strength Carbon-Manganese Steel of Structural Quality," West Conshohocken, PA, 2005.

M. ASTM A572-07, Standard "Specification for High-Strength Low-Alloy Columbium-Vanadium Structural Steel," West Conshohocken, PA.

N. ASTM A653-08, Standard "Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process," West Conshohocken, PA.

O. ASTM A792-08, Standard "Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process, " West Conshohocken, PA.

P. ASTM A1011-08, Standard "Specification for Steel Sheet and Strip Hot Rolled Carbon, Structural High Strength Low-Alloy and High Strength Low-Alloy with Improved Formability," West Conshohocken, PA.

Q. ASTM D1494-97(2008), Standard "Test Method for Diffused Light Transmission Factor of Reinforced Plastic panels," West Conshohocken, PA.

R. ASTM E159205, Standard "Test Method for Structural Performance of Sheet Metal Roof and Siding Systems by Uniform Static Air Pressure Difference," West Conshohocken, PA.

S. AWS D1.3, Structural Welding Code - Sheet Steel, Miami, FL, 1998.

T. MBMA, Metal Building Systems Manual, Metal Building Manufacturers Association, Cleveland, OH, 2012.

U. SJI, (Steel Joist Institute) - Standard Specifications, Load Tables and Weight Tables for Steel Joists and Joist Girders, 42nd Edition.

V. SSPC, (Society for Protective Coatings) - SP-2 - Specification for Hand Tool Cleaning, 2004 (Part of Steel Structures Painting Manual, Vol. Two)

W. SSPC, - Paint 15 – Steel Joist Shop Primer/Metal Building Primer; Society for Protective Coatings; 2004 (Part of Steel Structures Painting Manual, Vol. Two)

X. SSPC, – Paint 20 – Zinc-Rich Primers (Type I, "Inorganic," and Type II, "Organic"); Society for Protective Coatings; 1991 (Part of Steel Structures Painting Manual, Vol. Two).

Y. UL 580, - Tests for Uplift Resistance of Roof Assemblies, 2006 (with Revisions through July 2009).

1.4. DESIGN REQUIREMENTS

A. The building shall be designed by the Manufacturer as a complete system. All components of the system shall be supplied or specified by the same manufacturer.

B. Design shall be in accordance with IBC 2012

C. Dead Loads: The dead load shall be the weight of the Metal Building System as determined by the system manufacturer.

D. Live Loads: The building system shall be capable of supporting a minimum uniform live load of 20 psf

E. Snow Loads: The design roof snow loads shall be 30 psf or as defined on the contract drawings.

F. Wind Loads: The design wind loads for the metal building system shall be for class C exposure at a 115 mph wind speed.

G. Seismic Loads: Seismic load shall be determined based upon seismic design category A.

H. Deflection requirements shall be in accordance with the applicable provisions of the IBC 2012

I. Thermal Effects: Standing Seam roof panels shall be free to move in response to the expansion and contraction forces resulting from a temperature variation.

J. Assembly to permit movement of components without buckling, failure of joint seals, undue stress on fasteners or other detrimental effects, when subject to temperature range of 120 degrees F

1.5. SUBMITTALS

A. Submit anchor bolt placement plan, column reactions, in advance of erection drawings.

B. Product Data: Provide data on:

1. profiles
2. component dimensions
3. fasteners
4. color selection

C. Shop or Erection Drawings: Indicate assembly dimensions, locations of structural members, connections, attachments, openings, cambers, loads, and

1. wall and roof system dimensions, panel layout, general construction details, anchorages and method of anchorage, installation [and]; framing anchor bolt settings, sizes, and locations from datum, foundation loads

1.6. QUALITY ASSURANCE

A. Fabricate structural steel members in accordance with MBMA Metal Building Systems Manual, and, for items not covered, AISC - Specification for Structural Steel Buildings.

1.7. QUALIFICATIONS

A. Manufacturer: The company manufacturing the products specified in this Section [shall have a minimum of 10 years' experience in the manufacture of steel building systems.

B. Erector shall have specialized experience in the erection of steel building systems for a period of at least 10 years.

1.8. FIELD MEASUREMENTS

A. Metal building contractor shall verify that field measurements are as indicated.

1.9. WARRANTY

A. Building manufacturer shall provide manufacturer's standard material warranty.

PART 2 - PRODUCTS

2.1. MATERIALS - ROOF SYSTEM

A. Sheet Steel Stock: galvanized steel, 29 ga

B. Closures: Manufacturer's standard type, closed cell or metal.

C. Fasteners: Manufacturer's standard type. Size and design to maintain load and weather tightness requirements. Fasteners to be stainless steel, head and shank

D. Sealant: Manufacturer's standard type.

E. Exterior Surfaces of Roof Panels: Precoated steel of silicone polyester finish, manufacturer's standard color.

F. Interior Surfaces of Roof Panels: Precoated steel with wash coat of manufacturer's standard finish.

2.2. MATERIALS - WALL SYSTEMS

A. Siding: Minimum 26 gauge metal thickness,

B. Closures: Manufacturer's standard type, closed cell or metal.

C. Fasteners: Manufacturer's standard type. Size and design to maintain load and weather tightness requirements. Fasteners to be stainless steel head and shank

D. Exterior Surfaces of Wall Panels: Precoated steel of silicone polyester finish, manufacturer's standard color option most closely matching the color option specified in Section 01 10 00.

E. Interior Surfaces of Wall Panels: Precoated steel with wash coat of silicone polyester, manufacturer's standard finish.

2.3. MATERIALS - TRIM

A. Flashings, Internal and External Corners, Closure Pieces: Same material and finish as adjacent material.

2.4. MATERIALS - METAL PERSONNEL DOORS AND FRAMES

A. Doors and frames shall be designed by their manufacturer to meet the wind load provisions.

2.5. MATERIALS - DOORS AND FRAMES, OTHER THAN PERSONNEL

A. Doors and frames shall be designed by their manufacturer to meet the wind load provisions.

B. Doors shall be designed using beam action to transfer loads from jamb to jamb.

2.6. MATERIALS - WINDOWS

A. Windows shall be designed by their manufacturer to meet the wind load provisions

B. Building systems manufacturer's standard window and frame type.

2.7. MATERIALS - TRANSLUCENT PANELS

A. Translucent roof panels shall be white translucent panels capable of sustaining a 200 pound concentrated load on a one foot square located anywhere on the panel without rupture. Translucent panels shall be compatible with the steel roof panels.

2.8. FABRICATION - PRIMARY FRAMING

A. Framing Members: Clean and prepare in accordance with SSPC-SP2 as a minimum, and coat with building manufacturer's standard primer.

B. Hot rolled members shall be fabricated in accordance with AISC Specification for pipe, tube, and rolled structural shapes.

C. Fabricate built-up members in accordance with MBMA Metal Building Systems Manual, Chapter IV Common Industry Practices.

2.9. FABRICATION - SECONDARY

A. Framing Members: Clean and prepare in accordance with SSPC-SP2, as a minimum, and coat with building manufacturer's standard primer.

B. Cold Formed Members: Cold formed structural shapes shall be fabricated in accordance with MBMA Metal Building Systems Manual, Chapter IV Common Industry Practices.

PART 3 - EXECUTION

3.1. EXECUTION

A. Erector to verify site conditions

B. Verify that foundation, floor slab, mechanical and electrical utilities, and placed anchors are in correct position and properly squared.

C. Provide access to the work as scheduled for owner provided inspections, if required. The cost of any required inspections is the responsibility of the owner.

D. Do not proceed until unsatisfactory conditions have been corrected.

3.2. ERECTION - FRAMING

A. Use templates for accurate setting of anchor rods. When required, level bearing plate area with steel wedges, shims or grout. Check all previously placed anchorages.

B. Erect building frame true and level with vertical members plumb and bracing properly installed. Maintain structural stability of frame during erection.

C. Ream holes requiring enlargement to admit bolts. Burned holes for bolted connections are not permitted without written approval by designer. Burned holes to be reamed.

D. Tighten bolts and nuts in accordance with manufacturer’s requirements.

E. The erector shall furnish temporary guys and bracing where needed for squaring, plumbing, and securing the structural framing against loads, such as wind loads acting on the exposed framing and seismic forces, as well as loads due to erection and erection operation, but not including loads resulting from the performance of work by others. Bracing furnished by the manufacturer for the metal building system cannot be assumed to be adequate during erection and are not to be used to pull frames into plumb condition.

F. The temporary guys, braces, falseworks and cribbing are the property of the erector, and the erector shall remove them immediately upon completion of erection.

G. Do not field cut or modify structural members without approval of the metal building manufacturer.

H. After erection, erector to prime welds, abrasions, and surfaces not shop primed or needing touch-up.

3.3. ERECTION - WALL AND ROOFING SYSTEMS

A. Install all wall and roofing systems in accordance with manufacturer's instructions and details.

B. Exercise care when cutting prefinished material to ensure cuttings do not remain on finish surface.

C. Fasten cladding system to structural supports, using proper fasteners aligned level and plumb.

D. Set purlins and girts at right angle and bolt to appropriate clips. Attach to clips as required to satisfy design loads and as shown on drawings.

E. Place screw down roof panels at right angle to purlins and girts. Attach and plumb wall panels as shown on drawings. Apply manufacturer’s roof panel side and end lap sealant between panel ends and side laps to provide water-tight installation.

F. Place Standing Seam Roof panels at right angle to purlins. Attach with sliding concealed clip where expansion and contraction must be accounted for. Follow manufacturer’s instructions for fastening and sealing end laps.

3.4. ERECTION - GUTTER, DOWNSPOUT, FLASHINGS AND TRIM

A. Install flashings and trim in strict accordance with manufacturer's instructions, using proper sheet metal procedures.

3.5. ERECTION - TRANSLUCENT PANELS

A. The translucent panels to be installed in accordance with manufacturer's instructions and details.

B. To be coordinated with installation of roofing and wall systems and related flashings and trims.

C. The installation to be made weathertight

3.6. INSTALLATION - ACCESSORIES

A. All roof and wall accessories to be installed weathertight.

3.7. TOLERANCES

A. All work shall be performed by experienced workmen in a workmanlike manner to published tolerances.

END OF SECTION

SECTION 22 10 00

PLUMBING PIPING

PART 1 - GENERAL

1.1. SUMMARY

A. Section includes pipe and pipe fittings

B. Valves

C. Sanitary waste and vent piping system

D. Water piping system

1.2. ACTION SUBMITTALS

A. Product Data: For each type of product.

1.3. INFORMATIONAL SUBMITTALS

A. Field quality-control reports.

PART 2 - PRODUCTS

2.1. COPPER TUBE AND FITTINGS

A. Wrought-Copper, Solder-Joint Fittings: ASME B16.22, wrought-copper pressure fittings.

B. Copper Unions:

1. MSS SP-123.
2. Cast-copper-alloy, hexagonal-stock body.
3. Ball-and-socket, metal-to-metal seating surfaces.
4. Solder-joint.

C. Copper Drainage Fittings: ASME B16.23, cast copper or ASME B16.29, wrought copper, solder-joint fittings.

2.2. SOLID-WALL PVC PIPE:

A. ASTM D 2665

B. Fittings: Socket type (ASTM D 2665).

C. Joints: Adhesive Primer (ASTM F 656) and Solvent Cement (ASTM D 2564).

2.3. HDPE (HIGH DENSITY POLYETHYLENE) PIPE

A. ASTM D3350

B. Pipe resin: PE4710

C. Fittings:

1. Electrofusion: up to 6” pipe
2. Butt fusion: 2-1/2” and larger
3. Mechanical joint: above-grade joints only

2.4. PEX PIPE (CROSS-LINKED POLYETHYLENE)

A. ASTM F876, ATSM F877

B. Fittings:

1. Crimp rings (ASTM F1807) and fittings (F877/F1807)
2. Clamp rings (ASTM F2098) and fittings (F877/F1807)

2.5. PIPING JOINING MATERIALS

A. Pipe-Flange Gasket Materials: Suitable for vacuum piping system contents.

1. ASME B16.21, nonmetallic, flat, full-face, asbestos free, 1/8-inch (3.2-mm) maximum thickness.

B. Solder Filler Metals: ASTM B 32, lead-free alloys.

C. Flux: ASTM B 813, water flushable.

D. Solvent Cements for Joining PVC Piping: ASTM D 2564. Include primer according to ASTM F 656.

E. Brazing Filler Metals: AWS A5.8/A5.8M, BCuP Series, copper-phosphorus alloys for general-duty brazing, unless otherwise indicated.

2.6. VALVES

A. Ball valves: Up to and including 4 inches: Bronze two piece body, chrome plated steel full-port ball, teflon seats and stuffing box ring, lever handle.

B. Vacuum breaker: Watts Series 800M4QT or approved equal.

2.7. TRANSITION FITTINGS

A. General Requirements:

1. Same size as pipes to be joined.
2. Pressure rating at least equal to pipes to be joined.
3. End connections compatible with pipes to be joined.

B. Fitting-Type Transition Couplings: Manufactured piping coupling or specified piping system fitting.

C. Plastic-to-Metal Transition Fittings:

1. Description:

a. PVC one-piece fitting with manufacturer's Schedule 80 equivalent dimensions.

b. One end with threaded brass insert and one solvent-cement-socket, fused, or threaded end.

PART 3 - EXECUTION

3.1. PIPING INSTALLATION

A. Drawing plans, schematics, and diagrams indicate general location and arrangement of water piping. Indicated locations and arrangements are used to size pipe and calculate friction loss, expansion, and other design considerations. Install piping as indicated unless deviations to layout are approved on coordination drawings.

B. Install copper tubing under building slab according to CDA's "Copper Tube Handbook."

C. Install piping indicated to be exposed and piping in equipment rooms and service areas at right angles or parallel to building walls. Diagonal runs are prohibited unless specifically indicated otherwise.

D. Install piping to permit valve servicing.

E. Install nipples, unions, special fittings, and valves with pressure ratings the same as or higher than the system pressure rating used in applications below unless otherwise indicated.

F. Provide clearance for installation of insulation and access to valves and fittings.

G. Provide access where valves and fittings are not exposed

H. Install piping free of sags and bends.

I. Group piping whenever practical at common elevations.

J. Install copper tubing under building slab according to CDA's "Copper Tube Handbook." Install ball valve directly upstream of each floor slab penetration.

K. Install underground copper tube in PE encasement according to ASTM A 674 or AWWA C105.

L. Install plastic pipe below grade in accordance with ASTM D2321.

M. Install unions in copper tubing at final connection to each piece of equipment, machine, and specialty.

N. Vent pipes shall extend minimum 12” above finish roof line or as required by code.

O. Install piping to allow for expansion and contraction without stressing pipe, joints, or connected equipment.

P. Sleeve pipe passing through partitions, walls and floors as follows:

1. Install schedule 40 pipe sleeves at fire rated walls and floors. Seal with UL approved fire stopping material as specified in 23 05 30.
2. Install minimum 18 gage pipe sleeves at non-rated walls.
3. Sleeves through floors should extend a minimum of 2” above finished floor.
4. Sleeves through walls should be flush with the wall surface.

3.2. CLEANOUTS

A. Install cleanouts in aboveground piping and building drain piping according to the following, unless otherwise indicated:

1. Size same as drainage piping up to NPS 4. Use NPS 4 for larger drainage piping unless larger cleanout is indicated.
2. Locate at each change in direction of piping greater than 45 degrees.
3. Locate at base of each vertical soil and waste stack.
4. Cleanouts serving piping in ceiling spaces shall not be located in the ceiling space but shall be routed up thru the floor above and installed as floor cleanouts.

3.3. PIPE JOINT CONNECTIONS

A. Ream ends of pipes and tubes and remove burrs.

B. Remove scale, slag, dirt, and debris from inside and outside of pipes, tubes, and fittings before assembly.

C. Threaded Joints: Thread pipe with tapered pipe threads according to ASME B1.20.1. Cut threads full and clean using sharp dies. Ream threaded pipe ends to remove burrs and restore full ID. Join pipe fittings and valves as follows:

1. Apply appropriate tape or thread compound to external pipe threads.
2. Damaged Threads: Do not use pipe or pipe fittings with threads that are corroded or damaged.

D. Soldered Joints for Copper Tubing: Apply ASTM B 813, water-flushable flux to end of tube. Join copper tube and fittings according to ASTM B 828 or CDA's "Copper Tube Handbook."

E. Joint Construction for Solvent-Cemented Plastic Piping: Clean and dry joining surfaces. Join pipe and fittings according to the following:

1. Comply with ASTM F 402 for safe-handling practice of cleaners, primers, and solvent cements. Apply primer.
2. PVC Piping: Join according to ASTM D 2855.

F. Joints for Dissimilar-Material Piping: Make joints using adapters compatible with materials of both piping systems.

3.4. TRANSITION FITTING INSTALLATION

A. Install transition couplings at joints of dissimilar piping.

B. Transition Couplings:

1. Install transition couplings at joints of piping with small differences in ODs.

3.5. VALVE INSTALLATION

A. Shutoff Valves:

1. Install full-port ball valve for piping NPS 2 (DN 50) and smaller.

2. Install butterfly valve for piping NPS 3 (DN 75) and larger.

3.6. IDENTIFICATION

A. Identify system components. Comply with requirements for identification materials and installation in Section 220553 "Identification for Plumbing Piping and Equipment."

3.7. FIELD QUALITY CONTROL

A. Perform the following tests and inspections:

1. Piping Inspections:

a. Do not enclose, cover, or put piping into operation until it has been inspected and approved by authorities having jurisdiction.

b. Reinspection: If authorities having jurisdiction find that piping will not pass tests or inspections, make required corrections and arrange for reinspection.

2. Piping Tests:

a. Test all piping hydrostatically at 100 psig or 150 percent of working pressure, whichever is greater, for a period of 4 hours. Observe piping during this period and repair all leaks.

B. Piping will be considered defective if it does not pass tests and inspections.

END OF SECTION

SECTION 26 05 19

LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

PART 1 - GENERAL

1.1. SUMMARY

A. Section Includes:

1. Building wires and cables rated 2000 V and less.

2. Connectors, splices, and terminations rated 2000 V and less.

1.2. ACTION SUBMITTALS

A. Product Data: For each type of product.

PART 2 - PRODUCTS

2.1. CONDUCTORS AND CABLES

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

B. Conductor and Cable Marking: Comply with wire and cable marking according to UL's "Wire and Cable Marking and Application Guide."

C. Conductors: Copper, complying with NEMA WC 70/ICEA S-95-658.

1. Conductor Insulation: Comply with NEMA WC 70/ICEA S-95-658 for Type THHN/THWN-2, Type XHHW-2 Conductor Insulation: Comply with UL 4703.

2.2. CONNECTORS AND SPLICES

A. Description: Factory-fabricated connectors and splices of size, ampacity rating, material, type, and class for application and service indicated; listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

PART 3 - EXECUTION

3.1. CONDUCTOR MATERIAL APPLICATIONS

A. Branch Circuits: Copper. Solid for No. 10 AWG and smaller; stranded for No. 8 AWG and larger.

3.2. CONDUCTOR INSULATION AND MULTICONDUCTOR CABLE APPLICATIONS AND WIRING METHODS

A. Exposed Branch Circuits, Including in Crawlspaces: Type THHN/THWN-2 or Type XHHW-2, single conductors in raceway.

B. Branch Circuits Concealed in Ceilings, Walls, and Partitions: Type THHN/THWN-2 or Type XHHW-2, single conductors in raceway.

3.3. INSTALLATION OF CONDUCTORS AND CABLES

A. Complete raceway installation between conductor and cable termination points according to Section 26 05 33 Raceways and Boxes for Electrical Systems prior to pulling conductors and cables.

B. Use manufacturer-approved pulling compound or lubricant where necessary; compound used must not deteriorate conductor or insulation. Do not exceed manufacturer's recommended maximum pulling tensions and sidewall pressure values.

C. Use pulling means, including fish tape, cable, rope, and basket-weave wire/cable grips, that will not damage cables or raceway.

D. Install exposed cables parallel and perpendicular to surfaces of exposed structural members and follow surface contours where possible.

E. Support cables according to Section 26 05 29 Hangers and Supports for Electrical Systems.

3.4. CONNECTIONS

A. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A-486B.

B. Make splices, terminations, and taps that are compatible with conductor material.

C. Wiring at Outlets: Install conductor at each outlet, with at least 12 inches of slack.

3.5. IDENTIFICATION

A. Identify and color-code conductors and cables according to Section 260553 "Identification for Electrical Systems."

B. Identify each spare conductor at each end with identity number and location of other end of conductor and identify as spare conductor.

3.6. SLEEVE AND SLEEVE-SEAL INSTALLATION FOR ELECTRICAL PENETRATIONS

A. Install sleeves and sleeve seals at penetrations of exterior floor and wall assemblies. Comply with requirements in Section 260544 "Sleeves and Sleeve Seals for Electrical Raceways and Cabling."

3.7. FIRESTOPPING

A. Apply firestopping to electrical penetrations of fire-rated floor and wall assemblies to restore original fire-resistance rating of assembly according to Section 078413 "Penetration Firestopping."

3.8. FIELD QUALITY CONTROL

A. Perform each of the following visual and electrical tests:

1. Inspect exposed sections of conductor and cable for physical damage and correct connection
2. Inspect compression applied connectors for correct cable match and indentation.
3. Inspect cable jacket and condition.
4. Continuity test on each conductor and cable.
5. Uniform resistance of parallel conductors.

B. Cables will be considered defective if they do not pass tests and inspections.

END OF SECTION

SECTION 26 05 33

RACEWAYS AND BOXES FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1. SUMMARY

A. Section Includes:

1. Metal conduits, and fittings.

2. Boxes, enclosures, and cabinets.

1.2. DEFINITIONS

A. GRC: Galvanized rigid steel conduit.

B. IMC: Intermediate metal conduit.

1.3. ACTION SUBMITTALS

A. Product Data: For metal conduits and fittings, hinged-cover enclosures, and cabinets.

PART 2 - PRODUCTS

2.1. METAL CONDUITS, TUBING, AND FITTINGS

A. Listing and Labeling: Metal conduits, tubing, and fittings shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

B. GRC: Comply with ANSI C80.1 and UL 6.

C. IMC: Comply with ANSI C80.6 and UL 1242.

D. LFMC: Flexible steel conduit with PVC jacket and complying with UL 360.

E. Fittings for Metal Conduit: Comply with NEMA FB 1 and UL 514B.

1. Expansion Fittings: Steel to match conduit type, complying with UL 651, rated for environmental conditions where installed, and including flexible external bonding jumper.

F. Joint Compound for IMC or GRC: Approved, as defined in NFPA 70, by authorities having jurisdiction for use in conduit assemblies, and compounded for use to lubricate and protect threaded conduit joints from corrosion and to enhance their conductivity.

2.2. BOXES, ENCLOSURES, AND CABINETS

A. General Requirements for Boxes, Enclosures, and Cabinets: Boxes, enclosures, and cabinets installed in wet locations shall be listed for use in wet locations.

B. Sheet Metal Outlet and Device Boxes: Comply with NEMA OS 1 and UL 514A.

C. Cast-Metal Outlet and Device Boxes: Comply with NEMA FB 1, Type FD, with gasketed cover.

D. Cast-Metal Access, Pull, and Junction Boxes: Comply with NEMA FB 1 and UL 1773, **cast aluminum** with gasketed cover.

E. Hinged-Cover Enclosures: Comply with UL 50 and NEMA 250, **Type 4 or Type 12** with continuous-hinge cover with flush latch unless otherwise indicated.

1. Metal Enclosures: Steel, finished inside and out with manufacturer's standard enamel.

2. Interior Panels: Steel; all sides finished with manufacturer's standard enamel.

PART 3 - EXECUTION

3.1. RACEWAY APPLICATION

A. Indoors: Apply raceway products as specified below unless otherwise indicated:

1. Exposed: **GRC** or **IMC**.

2. Concealed in Ceilings and Interior Walls and Partitions: **EMT.**

3. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): FMC, except use LFMC in damp or wet locations.

4. Damp or Wet Locations: **GRC or IMC**.

5. Boxes and Enclosures: NEMA 250, Type 4 or Type 12.

B. Minimum Raceway Size: **3/4-inch** trade size.

C. Raceway Fittings: Compatible with raceways and suitable for use and location.

1. Rigid and Intermediate Steel Conduit: Use threaded rigid steel conduit fittings unless otherwise indicated. Comply with NEMA FB 2.10.

2. EMT: Use **setscrew cast-metal** fittings. Comply with NEMA FB 2.10.

3. Flexible Conduit: Use only fittings listed for use with flexible conduit. Comply with NEMA FB 2.20.

3.2. INSTALLATION

A. Comply with NECA 1 and NECA 101 for installation requirements except where requirements on Drawings or in this article are stricter. Comply with NFPA 70 limitations for types of raceways allowed in specific occupancies and number of floors.

B. Keep raceways at least 6 inches (150 mm) away from parallel runs of flues and steam or hot-water pipes. Install horizontal raceway runs above water and steam piping.

C. Complete raceway installation before starting conductor installation.

D. Comply with requirements in Section 260529 "Hangers and Supports for Electrical Systems" for hangers and supports.

E. Install no more than the equivalent of three 90-degree bends in any conduit run except for control wiring conduits, for which fewer bends are allowed. Support within 12 inches of changes in direction.

F. Conceal conduit and EMT within finished walls, ceilings, and floors unless otherwise indicated. Install conduits parallel or perpendicular to building lines.

G. Support conduit within 12 inches of enclosures to which attached.

H. Threaded Conduit Joints, Exposed to Wet, Damp, Corrosive, or Outdoor Conditions: Apply listed compound to threads of raceway and fittings before making up joints. Follow compound manufacturer's written instructions.

I. Raceway Terminations at Locations Subject to Moisture or Vibration: Use insulating bushings to protect conductors including conductors smaller than No. 4 AWG.

J. Terminate threaded conduits into threaded hubs or with locknuts on inside and outside of boxes or cabinets. Install bushings on conduits up to 1-1/4-inch trade size and insulated throat metal bushings on 1-1/2-inch trade size and larger conduits terminated with locknuts. Install insulated throat metal grounding bushings on service conduits.

K. Install raceways square to the enclosure and terminate at enclosures with locknuts. Install locknuts hand tight plus 1/4 turn more.

L. Cut conduit perpendicular to the length. For conduits 2-inch trade size and larger, use roll cutter or a guide to make cut straight and perpendicular to the length.

M. Install pull wires in empty raceways. Use polypropylene or monofilament plastic line with not less than 200-lb (90-kg) tensile strength. Leave at least 12 inches of slack at each end of pull wire. Cap underground raceways designated as spare above grade alongside raceways in use.

N. Install raceway sealing fittings at accessible locations according to NFPA 70 and fill them with listed sealing compound. For concealed raceways, install each fitting in a flush steel box with a blank cover plate having a finish similar to that of adjacent plates or surfaces. Install raceway sealing fittings according to NFPA 70.

O. Install devices to seal raceway interiors at accessible locations. Locate seals so no fittings or boxes are between the seal and the following changes of environments. Seal the interior of all raceways at the following points:

   1. Where conduits pass from warm to cold locations, such as boundaries of refrigerated spaces.

   2. Where otherwise required by NFPA 70.

P. Expansion-Joint Fittings:

1. Install in each run of aboveground RMC **and EMT** conduit that is located where environmental temperature change may exceed 100 deg F (55 deg C) and that has straight-run length that exceeds 100 feet.
2. Install fitting(s) that provide expansion and contraction for at least 0.000078 inch per foot of length of straight run per deg F of temperature change for metal conduits.
3. Install expansion fittings at all locations where conduits cross building or structure expansion joints.
4. Install each expansion-joint fitting with position, mounting, and piston setting selected according to manufacturer's written instructions for conditions at specific location at time of installation. Install conduit supports to allow for expansion movement.

Q. Flexible Conduit Connections: Comply with NEMA RV 3. Use a maximum of 72 inches of flexible conduit for equipment subject to vibration, noise transmission, or movement; and for transformers and motors.
   1. Use LFMC in damp or wet locations.

R. Mount boxes at heights indicated on Drawings. If mounting heights of boxes are not individually indicated, give priority to ADA requirements. Install boxes with height measured to **center** of box unless otherwise indicated.

S. Locate boxes so that cover or plate will not span different building finishes.

T. Fasten junction and pull boxes to or support from building structure. Do not support boxes by conduits.

3.3. SLEEVE AND SLEEVE-SEAL INSTALLATION FOR ELECTRICAL PENETRATIONS

A. Install sleeves and sleeve seals at penetrations of exterior floor and wall assemblies. Comply with requirements in Section 26 05 44 "Sleeves and Sleeve Seals for Electrical Raceways and Cabling."

3.4. FIRESTOPPING

A. Install firestopping at penetrations of fire-rated floor and wall assemblies. Comply with requirements in Section 07 84 13 "Penetration Firestopping."

3.5. PROTECTION

A. Protect coatings, finishes, and cabinets from damage and deterioration.

Repair damage to galvanized finishes with zinc-rich paint recommended by manufacturer.

END OF SECTION 260533

SECTION 26 24 16

PANELBOARDS

PART 1 - GENERAL

1.1. SUMMARY

A. Section Includes:

1. Lighting and appliance branch-circuit panelboards.

1.2. DEFINITIONS

A. MCCB: Molded-case circuit breaker.

PART 2 - PRODUCTS

2.1. PANELBOARDS COMMON REQUIREMENTS

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

B. Comply with NEMA PB 1.

C. Comply with NFPA 70.

D. Enclosures: Flush-mounted, dead-front cabinets. Rated for environmental conditions at installed location.

E. Incoming Mains Location: Top.

F. Phase, Neutral, and Ground Buses: Tin-plated aluminum or Hard-drawn copper, 98 percent conductivity.

G. Conductor Connectors: Suitable for use with conductor material and sizes.

1. Material: Tin-plated aluminum or Hard-drawn copper, 98 percent conductivity.

2. Main and Neutral Lugs: Mechanical type, with a lug on the neutral bar for each pole in the panelboard.

3. Ground Lugs and Bus-Configured Terminators: Mechanical type, with a lug on the bar for each pole in the panelboard.

H. NRTL Label: Panelboards shall be labeled by an NRTL acceptable to authority having jurisdiction for use as service equipment with one or more main service disconnecting and overcurrent protective devices. Panelboards shall have meter enclosures, wiring, connections, and other provisions for utility metering. Coordinate with utility company for exact requirements.

2.2. LIGHTING AND APPLIANCE BRANCH-CIRCUIT PANELBOARDS

A. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings.

B. Panelboards: NEMA PB 1, lighting and appliance branch-circuit type.

C. Mains: Circuit breaker.

D. Branch Overcurrent Protective Devices: Plug-in or Bolt-on circuit breakers, replaceable without disturbing adjacent units.

2.3. DISCONNECTING AND OVERCURRENT PROTECTIVE DEVICES

A. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings

B. MCCB: Comply with UL 489, with interrupting capacity to meet available fault currents.

1. GFEP Circuit Breakers: Class B ground-fault protection (30-mA trip).

2. MCCB Features and Accessories:

a. Standard frame sizes, trip ratings, and number of poles.

b. Breaker handle indicates tripped status.

c. UL listed for reverse connection without restrictive line or load ratings.

d. Lugs: Mechanical style, suitable for number, size, trip ratings, and conductor materials.

2.4. IDENTIFICATION

A. Panelboard Label: Manufacturer's name and trademark, voltage, amperage, number of phases, and number of poles shall be located on the interior of the panelboard door.

B. Breaker Labels: Faceplate shall list current rating, UL and IEC certification standards, and AIC rating.

C. Circuit Directory: Directory card inside panelboard door, mounted in transparent card holder.

PART 3 - NOT USED

END OF SECTION 262416

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. Benching Slopes: Horizontally bench existing slopes greater than 1 foot vertical rise in 4 feet to key fill material to slope for firm bearing.

F. Stability: Replace damaged or displaced subsoil to same requirements as for specified fill.

G. Employ a compaction method that achieves the specified minimum compaction requirements as specified in Section 31 23 23 – Fill and Backfill

H. Employ a placement method that does not disturb or damage other work.

I. Do not fill over porous, wet, frozen or spongy subgrade surfaces.

J. Pre-watering, if required, shall be defined and paid for within the Section 01 10 00 Special Provisions.

K. Maintain optimal moisture levels to attain required compaction density.

L. Granular Fill: Place and compact materials in equal, continuous layers not exceeding 6 inches compacted depth or as indicated by a Geotechnical Report

M. 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.

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. Geotechnical testing shall be conducted at the discretion of the Engineer. The contractor will not be required to pay for such testing.

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 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:

¾" 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
¾"	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 used only according to the owner's preferences as indicated in Section 01 10 00 Special Provisions.

B. Fertilizer shall be an organic product.

C. 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 (P_2O_5) - percent.
    c. Soluble potash (K_2O) - percent.

D. Fertilizer shall be furnished and delivered in standard bags or bulk.

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. Subject to Owner preferences communicated in Section 01 10 00 Special Provisions.

B. Apply fertilizer at the rate specified.

C. Apply after smooth raking of topsoil and prior to roller compaction.

D. Do not apply fertilizer at the same time or with the same machine as will be used to apply seed.

E. Mix thoroughly into upper 2 inches of topsoil.

F. 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: Subject to the requirements of Section 01 10 00 Special Provisions.

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

SECTION 33 68 30

DISINFECTION OF WATER SYSTEMS

PART 1 - GENERAL

1.1. QUALITY CONTROL SUBMITTALS

A. Procedures and plans for disinfection and testing.

B. Method of disposal for disinfecting wastewater.

1.2. SEQUENCING AND SCHEDULING

A. Commence disinfection after completion of the following:

1. Hydrostatic and pneumatic testing, pressure testing, functional and performance testing and acceptance of pipelines, pumping systems, structures, and equipment.

2. Disinfection of processes used to supply water to system.

PART 2 - PRODUCTS

2.1. WATER FOR DISINFECTION AND TESTING

A. Use on-site well water

2.2. CONTRACTOR'S EQUIPMENT

A. Furnish chemicals and equipment, such as pumps and hoses, to accomplish disinfection.

PART 3 - EXECUTION

3.1. DISINFECTION OF WATER PIPING SYSTEMS

A. After water systems have been pressure tested and flushed, each system (including distribution system to building) shall be cleaned and disinfected using the following procedure, or an alternate procedure proposed by the contractor and accepted by the engineer:

1. Fill all new piping and fixtures with a 100 – 200 ppm solution of chlorine.

2. Close system for 24 hours.

3. Test chlorine residual by collecting water from all fixtures in a sanitized 5-gallon bucket. If the residual is less than 50 ppm after 24 hours, repeat this procedure until the system passes disinfection.

4. Starting with the fixture closest to the water source, flush the piping system with fresh water until the chlorine residual is less than 3 ppm.

a. Disinfection water and flush water must be collected and neutralized before disposal.

5. Specialized water processing equipment which may be sensitive to high levels of chlorine should be isolated and disinfected according to the manufacturer's recommendations.

END OF SECTION 33 68 30