Project Manual & Specifications

Camp Oakdale
Public Works
Equipment Storage Garage

Bid No. 2025-04

Prepared for:
Town of Montville
310 Norwich-New London Turnpike
Uncasville, Connecticut 06382

Revised: November 8, 2024 (Issued for Bid)
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I. ADVERTISEMENT TO BID

TOWN OF MONTVILLE
INVITATION FOR PROPOSALS
BID #2025-04

The Town of Montville is interested in receiving proposals for the *Camp Oakdale Public Works Equipment Storage Garage.* A copy of the plans and specifications is available at www.montville-ct.org.

All proposals are due no later than **December 10, 2024 at 10:00 AM** and must be received at the Finance Office prior to the due date and time. A proposal must be delivered by regular or overnight mail to the Town of Montville, Finance Office, 310 Norwich/New London Turnpike, Uncasville, Connecticut 06382, with the proposal contained in a sealed envelope marked **"Camp Oakdale Public Works Equipment Storage Garage"**. The proposal must be signed by a Company official. Proposals will be opened and read aloud in the Finance Office.

This contract is subject to state contract compliance requirements, including non- discrimination statutes and set-aside requirements. State law requires a minimum of twenty-five (25%) percent of the state-funded portion of the contract be set aside for award to subcontractors holding current certification as Small Business Enterprises ("SBE") from the Connecticut Department of Administrative Services ("DAS"). A minimum of 6.25% of the state-funded portion must be set aside for subcontractors holding current DAS certification as Minority-, Women-, and/or Disabled-owned businesses ("M/W/DisBE"). The contractor must demonstrate good faith effort to meet the 25% set-aside goals.

In addition to other reservations and conditions contained in the proposal documents, the Town of Montville reserves the right to waive any technical defects in the proposals received; to waive any formalities or irregularities; to reject any and all proposals for any reason, including that it or they do not conform to the terms and conditions described herein, as determined by the Town in its sole discretion; to accept or reject any part of any proposal received; to present and negotiate terms of a contract together or separately with any party submitting a proposal; to determine qualifications exclusively and finally; to request additional qualifications; and to select any proposal or part thereof based on any combination of factors, including the amount proposal, the time of completion, and the Town's best interests. The Town further reserves the right to retain all proposals submitted and to use any ideas in a proposal regardless of whether or not that proposal is selected.

Barbara Griffin
Director of Finance

II. MONTVILLE BID DISCLOSURE INFORMATION TO BIDDERS

BID DISCLOSURE

The Town of Montville reserves the right to reject any or all bids and waive any informalities or irregularities in the bid procedure or bids.

The Town may hold the bids for a period not to exceed ninety (90) days from the date of the bid opening to review the bids and investigate the bidders' qualifications prior to awarding the contract.

All bidders are advised the Town of Montville has enacted through resolutions the following special condition concerning Town bids and purchases.

1. Seller agrees that as a condition of his sale of goods and/or services to the Town of Montville, the Town of Montville will be authorized to deduct from the proceeds due Seller an amount not to exceed 25% of the total amount due Seller. Said amount is to be applied against any unpaid and overdue taxes, assessments, fees, or other charges levied by the town of Montville or any agency thereof against the Seller. The Seller further agrees that Seller shall insure that Seller has the right to withhold an amount not to exceed 25% from each subcontractor working for the Seller, and providing goods and/or services to the Town of Montville, and to remit such withheld money to the Town in full or partial satisfaction of any unpaid and overdue taxes, assessments, fees, or other charges levied by the Town of Montville or any agency thereof against such subcontractor.

III. INSTRUCTIONS TO BIDDERS

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ARTICLE 1 – DEFINED TERMS

1.01 Terms used in these Instructions to Bidders have the meanings indicated in the General Conditions and Supplementary Conditions. Additional terms used in these Instructions to Bidders have the meanings indicated below:

A. Issuing Office – The office from which the Bidding Documents are to be issued and where the bidding procedures are to be administered. In this case the *Finance Office, Montville Town Hall located at 310 Norwich New London Tpke, Uncasville, Connecticut 06382.*

ARTICLE 2 – COPIES OF BIDDING DOCUMENTS

2.01 Complete sets of the Bidding Documents are available digitally only as stated in the advertisement or invitation to bid. Neither the Owner nor Engineer will be responsible for full or partial sets of Bid Documents obtained from any other source.

2.02 Complete sets of Bidding Documents shall be used in preparing Bids; neither Owner nor Engineer assumes any responsibility for errors or misinterpretations resulting from the use of incomplete sets of Bidding Documents.

2.03 Owner and Engineer, in making copies of Bidding Documents available on the above terms, do so only for the purpose of obtaining Bids for the Work and do not authorize or confer a license for any other use.

ARTICLE 3 – QUALIFICATIONS OF BIDDERS

3.01 To demonstrate Bidder's qualifications to perform the Work, within **5** days of Owner's request, Bidder shall submit written evidence such as financial data, previous experience, present commitments, and such other data as may be called for below or as otherwise requested by the Owner.

A. Not Applicable

B. List of major equipment available for this contract.

3.02 Bidder is advised to carefully review those portions of the Bid Form requiring Bidder's representations and certifications.

ARTICLE 4 – EXAMINATION OF BIDDING DOCUMENTS, OTHER RELATED DATA, AND SITE

4.01 Not Applicable

4.02 Underground Facilities

A. Information and data shown or indicated in the Bidding Documents with respect to existing Underground Facilities at or contiguous to the Site is based upon information and data furnished to Owner and Engineer by owners of such Underground Facilities, including Owner, or others.

4.03 Not Applicable

4.04 Not Applicable

4.05 On request, Owner will provide Bidder access to the Site to conduct such examinations, investigations, explorations, tests, and studies as Bidder deems necessary for submission of a Bid. Bidder shall fill all holes and clean up and restore the Site to its former condition upon completion of such explorations, investigations, tests, and studies. Bidder shall comply with all applicable Laws and Regulations relative to excavation and utility locates. *The Bidder must perform these investigations within the bid advertisement period and at a time at the discretion of the Owner*.

4.06 Not Applicable

4.07 It is the responsibility of each Bidder before submitting a Bid to:

A. examine and carefully study the Bidding Documents, and the other related data identified in the Bidding Documents;

B. visit the Site and become familiar with and satisfy Bidder as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work;

C. become familiar with and satisfy Bidder as to all federal, state, and local Laws and Regulations that may affect cost, progress, and performance of the Work;

D. Not Applicable

E. Not Applicable

F. agree at the time of submitting its Bid that no further examinations, investigations, explorations, tests, studies, or data are necessary for the determination of its Bid for performance of the Work at the price(s) bid and within the times required, and in accordance with the other terms and conditions of the Bidding Documents;

G. become aware of the general nature of the work to be performed by Owner and others at the Site that relates to the Work as indicated in the Bidding Documents;

H. promptly give Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Bidder discovers in the Bidding Documents and confirm that the written resolution thereof by Engineer is acceptable to Bidder; and

I. determine that the Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for the performance of the Work.

4.08 The submission of a Bid will constitute an incontrovertible representation by Bidder that Bidder has complied with every requirement of this Article 4, that without exception the Bid is premised upon performing and furnishing the Work required by the Bidding Documents and applying any specific means, methods, techniques, sequences, and procedures of construction that may be shown or indicated or expressly required by the Bidding Documents, that Bidder has given Engineer written notice of all conflicts, errors, ambiguities, and discrepancies that Bidder has

discovered in the Bidding Documents and the written resolutions thereof by Engineer are acceptable to Bidder, and that the Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performing and furnishing the Work.

ARTICLE 5 – PRE-BID CONFERENCE

5.01 There will be no prebid conference for this project.

ARTICLE 6 – SITE AND OTHER AREAS

6.01 The Site is identified in the Bidding Documents. Easements for permanent structures or permanent changes in existing facilities are to be obtained and paid for by Owner unless otherwise provided in the Bidding Documents. All additional lands and access thereto required for temporary construction facilities, construction equipment, or storage of materials and equipment to be incorporated in the Work are to be obtained and paid for by Contractor.

ARTICLE 7 – INTERPRETATIONS AND ADDENDA

7.01 No interpretation of the meaning of the Drawings, Specifications, or other prebid documents will be made to any bidder orally. *Every request for such interpretation must be in writing and addressed to Kyle Haubert, CLA Engineers, Inc., 317 Main Street, Norwich, CT 06360; Fax: 860-886-9165, email at: khaubert@claengineers.com.* Interpretations or clarifications considered necessary in response to such questions will be issued by Addenda. Questions received less than five (5) days prior to the date and time for opening of Bids may not be answered. Only questions answered by Addenda will be binding. Oral and other interpretations or clarifications will be without legal effect.

7.02 Addenda may be issued to clarify, correct, or change the Bidding Documents as deemed advisable by Owner or Engineer.

7.03 *Potential Bidders are responsible for checking the Town of Montville website at http://www.townofmontville.org/ for any addendums and updates regarding this Bid.*

ARTICLE 8 – BID SECURITY

8.01 A Bid must be accompanied by Bid security made payable to Owner in an amount of **5** percent of Bidder's maximum Bid price and in the form of a certified check, bank money order, or a Bid bond (on the form attached) issued by a surety meeting the requirements of Paragraphs 5.01 and 5.02 of the General Conditions.

8.02 The Bid security of the Successful Bidder will be retained until such Bidder has executed the Contract Documents, furnished the required contract security and met the other conditions of the Notice of Award, whereupon the Bid security will be returned. If the Successful Bidder fails to execute and deliver the Contract Documents and furnish the required contract security within 15 days after the Notice of Award, Owner may consider Bidder to be in default, annul the Notice of Award, and the Bid security of that Bidder will be forfeited. Such forfeiture shall be Owner's exclusive remedy if Bidder defaults. The Bid security of other Bidders whom Owner believes to have a reasonable chance of receiving the award may be retained by Owner until the earlier of

seven days after the Effective Date of the Agreement or **120** days after the Bid opening, whereupon Bid security furnished by such Bidders will be returned.

8.03 Bid security of other Bidders whom Owner believes do not have a reasonable chance of receiving the award will be returned within seven days after the Bid opening.

ARTICLE 9 – CONTRACT TIMES

9.01 The number of days within which the Work is to be substantially completed and ready for final payment is set forth in the Agreement.

9.02 All time limits for Milestones, if any, Substantial Completion, and completion and readiness for final payment as stated in the Contract Documents are of the essence of the Contract.

9.03 Days to Achieve Substantial Completion and Final Payment

A. The Work will be substantially completed within **120** calendar days after the date when the Contract Times commence to run as provided in Paragraph 2.03 of the General Conditions, and completed and ready for final payment in accordance with Paragraph 14.07 of the General Conditions within **150** calendar days after the date when the Contract Times commence to run.

B. The time of completion shall exclude the time period from each December 1 through the following March 31 (the "winter shutdown period") in accordance with DOT Form 819 Section 1.08.07. The Contractor shall install temporary stabilization measures over any disturbed areas, and shall be required to maintain the site stability, and temporary measures in a stable and safe condition for traffic throughout the duration of the shutdown. There shall be no raised structures left in the roadway. The Contractor shall also be responsible for maintaining erosion & sedimentation control measures and disturbed earth slopes in stable condition throughout the duration of the shutdown. This work shall be completed at no additional expense to the Owner. The Contractor shall be required to return to the site on or before April 1st of the following year to complete the project. The Contractor may perform work during the "winter shutdown period" if weather conditions allow; there shall be no charge to the Contract Time for work performed during this period. There shall be no additional expense to the Owner for work during the "winter shutdown period". The Contractor shall maintain all unit prices as outlined in the Bid form through the winter shutdown period and for the duration of the contract.

ARTICLE 10 – LIQUIDATED DAMAGES

10.01 Provisions for liquidated damages are set forth in the Agreement and as follows.

10.02 Contractor and Owner recognize that time is of the essence as stated in Paragraph 4.01 above and that Owner will suffer financial loss if the Work is not completed within the times specified in Paragraph 4.02 above, plus any extensions thereof allowed in accordance with Article 12 of the General Conditions. The parties also recognize the delays, expense, and difficulties involved in proving in a legal or arbitration proceeding the actual loss suffered by Owner if the Work is not completed on time. Accordingly, instead of requiring any such proof, Owner and Contractor agree that as liquidated damages for delay (but not as a penalty), Contractor shall pay Owner **$1,000.00**

for each day that expires after the time specified in Paragraph 4.02 above for Substantial Completion until the Work is substantially complete.

ARTICLE 11 – SUBSTITUTE AND "OR-EQUAL" ITEMS

11.01 The Contract, if awarded, will be on the basis of materials and equipment specified or described in the Bidding Documents, or those substitute or "or-equal" materials and equipment approved by Engineer and identified by Addendum. The materials and equipment described in the Bidding Documents establish a standard of required type, function and quality to be met by any proposed substitute or "or-equal" item. No item of material or equipment will be considered by Engineer as a substitute or "or-equal" unless written request for approval has been submitted by Bidder and has been received by Engineer at least 15 days prior to the date for receipt of Bids. Each such request shall conform to the requirements of Paragraph 6.05 of the General Conditions. The burden of proof of the merit of the proposed item is upon Bidder. Engineer's decision of approval or disapproval of a proposed item will be final. If Engineer approves any proposed item, such approval will be set forth in an Addendum issued to all prospective Bidders. Bidders shall not rely upon approvals made in any other manner.

ARTICLE 12 – SUBCONTRACTORS, SUPPLIERS AND OTHERS

12.01 If the Supplementary Conditions require the identity of certain Subcontractors, Suppliers, individuals, or entities to be submitted to Owner in advance of a specified date prior to the Effective Date of the Agreement, the apparent Successful Bidder, and any other Bidder so requested, shall within five days after Bid opening, submit to Owner a list of all such Subcontractors, Suppliers, individuals, or entities proposed for those portions of the Work for which such identification is required. Such list shall be accompanied by an experience statement with pertinent information regarding similar projects and other evidence of qualification for each such Subcontractor, Supplier, individual, or entity if requested by Owner. If Owner or Engineer, after due investigation, has reasonable objection to any proposed Subcontractor, Supplier, individual, or entity, Owner may, before the Notice of Award is given, request apparent Successful Bidder to submit a substitute, without an increase in the Bid.

12.02 If apparent Successful Bidder declines to make any such substitution, Owner may award the Contract to the next lowest Bidder that proposes to use acceptable Subcontractors, Suppliers, individuals, or entities. Declining to make requested substitutions will not constitute grounds for forfeiture of the Bid security of any Bidder. Any Subcontractor, Supplier, individual, or entity so listed and against which Owner or Engineer makes no written objection prior to the giving of the Notice of Award will be deemed acceptable to Owner and Engineer subject to revocation of such acceptance after the Effective Date of the Agreement as provided in Paragraph 6.06 of the General Conditions.

12.03 Contractor shall not be required to employ any Subcontractor, Supplier, individual, or entity against whom Contractor has reasonable objection.

ARTICLE 13 – PREPARATION OF BID

13.01 The Bid Form is included with the Bidding Documents. Additional copies may be obtained from the Engineer.

13.02 All blanks on the Bid Form shall be completed in ink and the Bid Form signed in ink. Erasures or alterations shall be initialed in ink by the person signing the Bid Form. A Bid price shall be indicated for each part of the Bid Proposal, bid item, and unit price item listed therein. The Bid price(s) shall be written in both words and figures, and in the case of a discrepancy between the two the amount in words shall govern.

13.03 A Bid by a corporation shall be executed in the corporate name by the president or a vice-president or other corporate officer accompanied by evidence of authority to sign. The corporate seal shall be affixed and attested by the secretary or an assistant secretary. The corporate address and state of incorporation shall be shown.

13.04 A Bid by a partnership shall be executed in the partnership name and signed by a partner (whose title must appear under the signature), accompanied by evidence of authority to sign. The official address of the partnership shall be shown.

13.05 A Bid by a limited liability company shall be executed in the name of the firm by a member and accompanied by evidence of authority to sign. The state of formation of the firm and the official address of the firm shall be shown.

13.06 A Bid by an individual shall show the Bidder's name and official address.

13.07 A Bid by a joint venture shall be executed by each joint venturer in the manner indicated on the Bid Form. The official address of the joint venture shall be shown.

13.08 All names shall be printed in ink below the signatures**.**

13.09 The Bid shall contain an acknowledgment of receipt of all Addenda, the numbers of which shall be filled in on the Bid Form.

13.10 Postal and e-mail addresses and telephone number for communications regarding the Bid shall be shown.

13.11 The Bid shall contain evidence of Bidder's authority and qualification to do business in the state where the Project is located, or Bidder shall covenant in writing to obtain such authority and qualification prior to award of the Contract and attach such covenant to the Bid. Bidder's state contractor license number, if any, shall also be shown on the Bid Form.

13.12 Bidders shall include a statement that they and all subcontractors will comply with Executive Order No. Three, Executive Order No. Sixteen and Executive Order No. Seventeen, Office of Federal Contract Compliance Programs (OFCC) Executive Order No. 11246, Executive Order 12549 and CGS 31-53a, and federal regulation 2 CFR 200.216 as amended, copies of which are attached at the end of this document.

13.13 All bidders shall complete and submit the following documents with their bid:

A. Proposal Form:
Acknowledgement of Addendums

B. Bid Form – Unit Pricing
C. Bid Security (Bid Bond or Certified Check)
D. Statement of Bidder's Qualifications
E. Proposed Subcontractors
F. Proposed Suppliers
G. Non-Collusion Affidavit
H. Non-Discrimination in Employment
I. Certificate as to Corporate Principal
J. CHRO Bidder Contract Compliance Form

ARTICLE 14 – BASIS OF BID; COMPARISON OF BIDS

14.01 Unit Price

A. Bidders shall submit a Bid on a unit price basis for each item of Work listed in the Bid schedule.

B. The total of all estimated prices will be the sum of the products of the estimated quantity of each item and the corresponding unit price. The final quantities and Contract Price will be determined in accordance with Paragraph 11.03 of the General Conditions.

C. Discrepancies between the multiplication of units of Work and unit prices will be resolved in favor of the unit prices. Discrepancies between the indicated sum of any column of figures and the correct sum thereof will be resolved in favor of the correct sum.

14.02 Allowances

A. For cash allowances the Bid price shall include such amounts as the Bidder deems proper for Contractor's overhead, costs, profit, and other expenses on account of cash allowances, if any, named in the Contract Documents, in accordance with Paragraph 11.02.B of the General Conditions.

ARTICLE 15 – SUBMITTAL OF BID

15.01 Sealed Bids **One (1) Original and a PDF version on a USB drive (or equal) of all bid documents** shall be submitted no later than the date and time prescribed and at the place indicated in the advertisement or invitation to bid and shall be enclosed in a plainly marked package with the Project title, bid number, time of bid opening and date, the name and address of Bidder, and shall be accompanied by the Bid security and other required documents. If a Bid is sent by mail or other delivery system, the sealed envelope containing the Bid shall be enclosed in a separate package plainly marked on the outside with the notation "BID ENCLOSED." A mailed Bid shall be addressed to the *Finance Office, Montville Town Hall located at 310 Norwich New London Tpke, Uncasville, Connecticut 06382*, and must arrive prior to the date and time of Bid Opening.

Sales and Use Tax: Vendors are reminded that the Connecticut State Sales and Use Tax and associated Federal taxes are not applicable under this contract, and therefore these taxes are not to be included in the price.

Under the terms of Connecticut Agencies Regulations §12-426-18, Contractors and Subcontractors, the contractor may purchase materials and supplies as are to be installed or placed in projects being performed under these contracts and will remain in such projects after completion, including tangible personal property that remains tangible personal property after its installation or placement, without payment of the tax and shall not charge any such exempt organization or agency any sales or use tax thereon.

15.02 The bidder agrees and warrants that in the submission of this sealed bid, they will not discriminate or permit discrimination against any person or group of persons on the grounds of race, color, religion, national origin, sex, or physical disability including, but not limited to blindness, unless it is shown by such bidder that such disability prevents performance of that which must be done to successfully fulfill the terms of this sealed bid or in any manner which is prohibited by the laws of the United States or the State of Connecticut: and further agrees to provide the Human Relations Commission with such information requested by the Commission concerning the employment practices and procedures of the bidder. An Affirmative Action Statement will be required by the successful bidder.

ARTICLE 16 – MODIFICATION AND WITHDRAWAL OF BID

16.01 A Bid may be modified or withdrawn by an appropriate document duly executed in the same manner that a Bid must be executed and delivered to the place where Bids are to be submitted prior to the date and time for the opening of Bids or authorized postponement thereof.

16.02 If within 24 hours after Bids are opened any Bidder files a duly signed written notice with Owner and promptly thereafter demonstrates to the reasonable satisfaction of Owner that there was a material and substantial mistake in the preparation of its Bid, that Bidder may withdraw its Bid, and the Bid security will be returned. Thereafter, if the Work is rebid, that Bidder will be disqualified from further bidding on the Work. This provision to withdraw a Bid without forfeiting the Bid Security does not apply to Bidder's errors in judgment in preparing the Bid.

ARTICLE 17 – OPENING OF BIDS

17.01 Bids will be opened at the time and place indicated in the Advertisement or Invitation to Bid and, unless obviously non-responsive, read aloud publicly. An abstract of the amounts of the base Bids and major alternates, if any, will be made available to Bidders after the opening of Bids.

ARTICLE 18 – BIDS TO REMAIN SUBJECT TO ACCEPTANCE

18.01 All Bids will remain subject to acceptance for the period of time stated in the Bid Form, but Owner may, in its sole discretion, release any Bid and return the Bid security prior to the end of this period.

ARTICLE 19 – EVALUATION OF BIDS AND AWARD OF CONTRACT

19.01 Owner reserves the right to reject any or all Bids or any part of any Bid, including without limitation, nonconforming, nonresponsive, unbalanced, or conditional Bids. Owner further reserves the right to reject the Bid of any Bidder whom it finds, after reasonable inquiry and evaluation, to not be responsible. Owner may also reject the Bid of any Bidder if Owner believes that it would not be in the best interest of the Project to make an award to that Bidder. Owner also reserves the right to waive all informalities not involving price, time, or changes in the Work and to negotiate contract terms with the Successful Bidder.

19.02 More than one Bid for the same Work from an individual or entity under the same or different names will not be considered. Reasonable grounds for believing that any Bidder has an interest in more than one Bid for the Work may be cause for disqualification of that Bidder and the rejection of all Bids in which that Bidder has an interest.

19.03 In evaluating Bids, Owner will consider whether or not the Bids comply with the prescribed requirements, and such alternates, unit prices and other data, as may be requested in the Bid Form or prior to the Notice of Award.

19.04 In evaluating Bidders, Owner will consider the qualifications of Bidders and may consider the qualifications and experience of Subcontractors, Suppliers, and other individuals or entities proposed for those portions of the Work for which the identity of Subcontractors, Suppliers, and other individuals or entities must be submitted as provided in the Supplementary Conditions.

19.05 Owner may conduct such investigations as Owner deems necessary to establish the responsibility, qualifications, and financial ability of Bidders, proposed Subcontractors, Suppliers, individuals, or entities proposed for those portions of the Work in accordance with the Contract Documents.

19.06 If Contract is to be awarded, Owner will award the Contract to the responsible Bidder who's Bid, conforming with all the material terms and conditions of the Instructions to Bidders, is lowest, price and other factors considered. *The lowest price will be determined based on the "Total Base Bid Price", or if the Owner elects to perform any "Alternate" work if specified on the Bid Form the Base Bid Price as modified by the selected "Alternate" amount(s).* If detailed in the bid form, factors such as discounts, transportation costs, and life cycle costs may be used to determine which bidder, if any, is to be offered the award.

19.07 *The Town of Montville reserves the right to award in part, to reject any and all, in whole or in part, for misrepresentation or if the respondent is in default of any prior Town contract, or if the Respondent limits or modifies any of the terms and conditions and/or specifications of the Request. The Town also reserves the right to waive technical defects, irregularities and omissions if, in its judgment, the best interest of the Town will be served.*

ARTICLE 20 – CONTRACT SECURITY AND INSURANCE

20.01 Article 5 of the General Conditions, as may be modified by the Supplementary Conditions, sets forth Owner's requirements as to performance and payment bonds and insurance. When the Successful Bidder delivers the executed Agreement to Owner, it shall be accompanied by such bonds.

ARTICLE 21 – SIGNING OF AGREEMENT

21.01 When Owner issues a Notice of Award to the Successful Bidder, it shall be accompanied by the required number of unsigned counterparts of the Agreement along with the other Contract Documents which are identified in the Agreement as attached thereto. Within 15 days thereafter, Successful Bidder shall sign and deliver the required number of counterparts of the Agreement and attached documents to Owner. Within ten days thereafter, Owner shall deliver one fully signed counterpart to Successful Bidder with a complete set of the Drawings with appropriate identification.

ARTICLE 22 – SALES AND USE TAXES

22.01 Owner is exempt from Connecticut state sales and use taxes on materials and equipment to be incorporated in the Work. (Exemption Number will be provided after execution of the agreement). Said taxes shall not be included in the Bid. Refer to Paragraph 6.10 of the Supplementary Conditions for additional information.

ARTICLE 23 – RETAINAGE

23.01 Owner shall make progress payments on account of the Contract Price on the basis of Contractor's Applications for Payment on or about the Last day of each month during performance of the Work as provided below. All such payments will be measured by the schedule of values established as provided in Paragraph 2.07.A of the General Conditions (and in the case of Unit Price Work based on the number of units completed) or, in the event there is no schedule of values, as provided in the General Requirements.

1. Prior to Substantial Completion, progress payments will be made in an amount equal to the percentage indicated below but, in each case, less the aggregate of payments previously made and less such amounts as Engineer may determine or Owner may withhold, including but not limited to liquidated damages, in accordance with Paragraph 14.02 of the General Conditions.

    a. **95** percent of Work completed (with the balance being retainage); and

    b. **0** percent of cost of materials and equipment not incorporated in the Work (with the balance being retainage).

23.02 Upon Substantial Completion, Owner shall pay an amount sufficient to increase total payments to Contractor to **95** percent of the Work completed, less such amounts as Engineer shall determine in accordance with Paragraph 14.02.B.5 of the General Conditions and less 200 percent of Engineer's estimate of the value of Work to be completed or corrected as shown on the tentative list of items to be completed or corrected attached to the certificate of Substantial Completion.

ARTICLE 24 – EMPLOYMENT OF LABOR

24.01 The wages paid to mechanics, laborers or workmen employed upon the work herein contracted to be done shall be at a rate equal to the rate of wages prevailing for the same work in the same trade or occupation in the **Montville** area as determined by the labor Commissioner of the State of

Connecticut. See Section 31.53 of the General Statutes of the State of Connecticut, Revision of 195S, as amended.

24.02 Public Act 79-325 passes by the 1979 Legislature covers exemptions from Section 31.53 of the General Statutes. Under the new exemptions, effective *October 31, 2017*, the regulations that the prevailing wage must be paid for work performed by contractors and subcontractors in connection with work on public facilities will not apply:

To public work alterations, repair, refinishing projects with total cost of less than $100,000.
To public works new construction with a total cost of less than $1,000,000.

All Bidders are informed that the project is considered NEW construction.

24.03 All Bidders are advised to inform themselves and to comply with the requirements of Federal, State and local laws governing the employment of labor.

24.04 The Contractor shall provide certified payroll sheets to the Owner which includes all employees involved with the project for each payroll period during the course of the project.

ARTICLE 25 – PROVISIONAL ITEMS

25.01 Provisional items are delineated in the bid form. Quantities for provisional items may or may not be used in whole or in part at the discretion of the Owner. This shall in no way affect the established contract unit prices. All bid unit prices for provisional items shall be added to establish the total bid amount.

ARTICLE 26 – SAFETY STANDARDS

26.01 Bidder agrees to comply with all of the latest Federal and State Safety Standards and Regulations and certifies that all work required in this bid will conform to and comply with said standards and regulations. Bidder further agrees to indemnify and hold harmless the Town for all damages assessed against the Town as a result of Bidder's failure to comply with said standards and/or regulations.

26.02 Safety and Health Standards: Successful bidders must demonstrate compliance with all applicable OSHA standards including without limitations the following standards:

29 CFR 1926.650 "Excavations-Scope, application, and definitions"
29 CFR 1926.651 "Excavations-Specific Excavation Requirements"
29 CFR 1926.652 "Excavations-Requirements for Protective Systems"
29 CFR 1926.Subpart P Appendix F – "Selection of Protective Systems"
29 CFR 1910.1200 "Hazard Communication"
29 CFR 1910.146 "Permit Required Confined Spaces"
DOT "Pipeline Safety Regulations Part 192"

26.03 The successful bidder shall provide written documentation of each employee's "Operator Qualifications" for the appropriate required tasks.

26.04 The successful bidder shall provide written documentation of the companies Drug & Alcohol policy in accordance with DOT 49 CFR part 199 and DOT 49 CFR part 40

26.05 The successful bidder shall provide written "competent person" training documentation.

26.06 The contractor is responsible for ensuring OSHA compliance, and his responsibility includes supervising and monitoring work site conditions for OSHA compliance. If the contractor uses subcontractors the contractor is responsible for ensuring that the subcontractors fulfill their obligations with respect to employee safety, particularly including those which affect the entire site.

26.07 The Owner shall consider OSHA violations(s) over the past five years in determining the ability of the Contractor to comply with OSHA requirements and in determining whether contractor is a responsible bidder. If there has been an OSHA violation within the past five (5) years (measured from the date of the bid), the contractor shall provide copies of the citation(s), all documents regarding final determination of such citations including settlement any explanation(s) of such violation(s).

ARTICLE 27 – CHRO COMPLIANCE & STATE SET ASIDE

27.01 The contractor who is selected to perform this State project must comply with CONN. GEN. STAT. §§ 4a-60, 4a-60a, 4a-60g, and 46a-68b through 46a-68f, inclusive, as amended by June 2015 Special Session Public Act 15-5.

27.02 State law requires a minimum of twenty-five (25%) percent of the state-funded portion of the contract be set aside for award to subcontractors holding current certification from the Connecticut Department of Administrative Services ("DAS") under the provisions of CONN. GEN. STAT. § 4a-60g. (25% of the total state-funded value with DAS-certified Small Businesses and 6.25% of the total state-funded value with DAS-certified Minority-, Women-, and/or Disabled-owned Businesses.) The contractor must demonstrate good faith effort to meet the 25% set-aside goals.

24.03 **The successful Bidder shall submit the required project-specific Set-Aside Plan to the CHRO. Training for contractors is available here.**

BID FORM

CAMP OAKDALE
PUBLIC WORKS EQUIPMENT STORAGE GARAGE

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ARTICLE 1 – BID RECIPIENT

1.01 This Bid is submitted to:
Town of Montville
Finance Department
310 Norwich-New London Turnpike
Uncasville, CT 06382

1.02 The undersigned Bidder proposes and agrees, if this Bid is accepted, to enter into an Agreement with Owner in the form included in the Bidding Documents to perform all Work as specified or indicated in the Bidding Documents for the prices and within the times indicated in this Bid and in accordance with the other terms and conditions of the Bidding Documents.

ARTICLE 2 – BIDDER'S ACKNOWLEDGEMENTS

2.01 Bidder accepts all of the terms and conditions of the Instructions to Bidders, including without limitation those dealing with the disposition of Bid security. This Bid will remain subject to acceptance for **60** days after the Bid opening, or for such longer period of time that Bidder may agree to in writing upon request of Owner.

ARTICLE 3 – BIDDER'S REPRESENTATIONS

3.01 In submitting this Bid, Bidder represents that:

A. Bidder has examined and carefully studied the Bidding Documents, other related data identified in the Bidding Documents, and the following Addenda, receipt of which is hereby acknowledged:

Addendum No.	Addendum Date

B. Bidder has visited the Site and become familiar with and is satisfied as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work.

C. Bidder is familiar with and is satisfied as to all Laws and Regulations that may affect cost, progress, and performance of the Work.

D. Not Applicable

E. Bidder has considered the information known to Bidder; information commonly known to contractors doing business in the locality of the Site; information and observations obtained from visits to the Site; the Bidding Documents; and drawings identified in the

Bidding Documents, with respect to the effect of such information, observations, and documents on (1) the cost, progress, and performance of the Work; (2) the means, methods, techniques, sequences, and procedures of construction to be employed by Bidder, including applying the specific means, methods, techniques, sequences, and procedures of construction expressly required by the Bidding Documents; and (3) Bidder's safety precautions and programs.

F. Based on the information and observations referred to in Paragraph 3.01.E above, Bidder does not consider that further examinations, investigations, explorations, tests, studies, or data are necessary for the determination of this Bid for performance of the Work at the price(s) bid and within the times required, and in accordance with the other terms and conditions of the Bidding Documents.

G. Bidder is aware of the general nature of work to be performed by Owner and others at the Site that relates to the Work as indicated in the Bidding Documents.

H. Bidder has given Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Bidder has discovered in the Bidding Documents, and the written resolution thereof by Engineer is acceptable to Bidder.

I. The Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for the performance of the Work for which this Bid is submitted.

ARTICLE 4 – BIDDER'S CERTIFICATION

4.01 Bidder certifies that:

A. This Bid is genuine and not made in the interest of or on behalf of any undisclosed individual or entity and is not submitted in conformity with any collusive agreement or rules of any group, association, organization, or corporation;

B. Bidder has not directly or indirectly induced or solicited any other Bidder to submit a false or sham Bid;

C. Bidder has not solicited or induced any individual or entity to refrain from bidding; and

D. Bidder has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for the Contract. For the purposes of this Paragraph 4.01.D:

1. "corrupt practice" means the offering, giving, receiving, or soliciting of any thing of value likely to influence the action of a public official in the bidding process;

2. "fraudulent practice" means an intentional misrepresentation of facts made (a) to influence the bidding process to the detriment of Owner, (b) to establish bid prices at artificial non-competitive levels, or (c) to deprive Owner of the benefits of free and open competition;

3. "collusive practice" means a scheme or arrangement between two or more Bidders, with or without the knowledge of Owner, a purpose of which is to establish bid prices at artificial, non-competitive levels; and

4. "coercive practice" means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in the bidding process or affect the execution of the Contract.

ARTICLE 5 – BASIS OF BID

5.01 Bidder will complete the Work in accordance with the Contract Documents for the following price(s):

Unit prices are to be written in both words and figures. In case of discrepancy, the unit price shown in words will govern.

BASE BID:

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	AMOUNT
1.	Mobilization	L.S.	L.S.	_____	_____

UNIT PRICE IN WORDS: _____

_____

2.	Provisional Item Rock Excavation & Disposal	20	C.Y.	_____	_____

UNIT PRICE IN WORDS: _____

_____

3. Site Work

Shall include installation and maintenance of erosions and sedimentation controls, site preparation, maintenance and protection of traffic, temporary fencing, construction stake-out and layout, stump removal and backfill, stripping and stockpiling of soils, trench excavation, general excavation, furnish and install fill as needed, modular concrete block retaining wall, grading, gravel surfacing, and all surface restoration as outlined on the site plan, and all work not specifically listed elsewhere.

L.S. L.S. _____ _____

UNIT PRICE IN WORDS: _____

_____

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	AMOUNT

4. Design-Build: Metal Equipment Storage Garage
   Shall include the design and installation of a metal building or post frame system meeting the requirements of the technical specifications. Shall include all costs for design, fabrication, transportation, and installation of the metal building system. Shall include extension of electrical branch circuits from the existing panel in the adjacent shed for emergency lighting and safety. Shall include all work not specifically listed elsewhere. State building permit fee of $0.26/$1,000 of construction value shall be included in this item.

   L.S. L.S. _____ _____

UNIT PRICE IN WORDS: _____

_____

5. Design-Build: Metal Equipment Storage Garage Foundation
   Shall include the design and installation of a foundation system for the metal building meeting the requirements of the technical specifications. Shall include all costs for design, fabrication, and installation of the foundation system and concrete floor, and all work not specifically listed elsewhere.

   L.S. L.S. _____ _____

UNIT PRICE IN WORDS: _____

_____

TOTAL BASE BID AMOUNT: _____

TOTAL BASE BID AMOUNT IN WORDS: _____

_____

ADD ALTERNATES:

The undersigned bidder further proposes and agrees that, should any of the following alternates be accepted by the Owner, the amount of the Total Base Bid, as heretofore stated shall be **INCREASED** by the amount of the selected alternates.

Unit prices are to be written in both words and figures. In case of discrepancy, the unit price shown in words will govern.

This work shall include the following:

Add Alternate #1

1. Electrical Work – New Service:
   Provide a new 200-amp electrical panel. Provide conduit, handholes, caps, pull strings, trench excavation and backfill, and surface restoration. Conduit shall be laid for the new electrical service and for future telecommunications service.

LUMP SUM PRICE: _____

LUMP SUM PRICE IN WORDS: _____

_____

Add Alternate #2

2. Electrical Work – Interior Receptacles:
   Provide surface mounted electrical outlets and metal conduit within the building. Shall include all mounting hardware, conduit, junction boxes, outlets & boxes, and all work necessary for a fully functioning electrical system.

LUMP SUM PRICE: _____

LUMP SUM PRICE IN WORDS: _____

_____

Add Alternate #3

3. Electrical Work – Lighting:
   Provide interior ceiling mounted LED lighting. Shall include all mounting hardware, conduit, junction boxes, switches, motion sensors, and all work necessary for a fully functioning lighting system.

LUMP SUM PRICE: _____

LUMP SUM PRICE IN WORDS: _____

_____

Add Alternate #4

4. Concrete Apron:
   Provide a concrete apron at the overhead doors. Shall include all excavation, backfill, formwork, concrete, reinforcing, and all work necessary of the concrete aprons.

LUMP SUM PRICE: _____

LUMP SUM PRICE IN WORDS: _____

_____

Add Alternate #5

5. Overhead Door Openers:
   Provide automatic overhead door openers at each of the four garage doors. Shall include all electrical wiring, conduit, mounting hardware, automatic openers, remote openers, and all other work as necessary for fully functioning automatic overhead door openers.

LUMP SUM PRICE: _____

LUMP SUM PRICE IN WORDS: _____

_____

Unit Prices have been computed in accordance with Paragraph 11.03.B of the General Conditions.

Bidder acknowledges that estimated quantities are not guaranteed, and are solely for the purpose of comparison of Bids, and final payment for all unit price Bid items will be based on actual quantities, determined as provided in the Contract Documents.

Provisional items are delineated in the bid form. Quantities for provisional items may or may not be used in whole or in part at the discretion of the Owner. This shall in no way affect the established contract unit prices. All bid unit prices for provisional items shall be added to establish the total bid amount.

This contract is to be awarded as outlined in Article 19 of the Instructions to Bidders. This contract is to be awarded to that responsible Bidder whose total bid is the lowest number of dollars for the above items.

ARTICLE 6 – TIME OF COMPLETION

6.01 Bidder agrees that the Work will be substantially complete and will be completed and ready for final payment in accordance with Paragraph 14.07 of the General Conditions within the number of calendar days indicated in the Instructions to Bidders and Agreement.

6.02 Bidder accepts the provisions of the Instructions to Bidders and the Agreement as to liquidated damages.

ARTICLE 7 – ATTACHMENTS TO THIS BID

7.01 The following documents are submitted with and made a condition of this Bid:

A. Required Bid security in the form of a Bid Bond, bank money order or Certified Check (circle type of security provided);
B. Statement of Bidders Qualifications
C. List of Proposed Subcontractors;
D. List of Proposed Suppliers;
E. Non-Discrimination in Employment Statement;
F. Non-Collusion Affidavit of Prime Bidder;
G. Certificate as to Corporate Principal;
H. CHRO Contract Compliance Form
H. Evidence of authority to do business in the state of the Project; or a written covenant to obtain such license within the time for acceptance of Bids;
I. Contractor's License No.: _____ *[or]* Evidence of Bidder's ability to obtain a State Contractor's License and a covenant by Bidder to obtain said license within the time for acceptance of Bids and;
J. A Form W-9
K. BUILDING MANUFACTURER & BUILDING INFORMATION

ARTICLE 8 – DEFINED TERMS

8.01 The terms used in this Bid with initial capital letters have the meanings stated in the Instructions to Bidders, the General Conditions, and the Supplementary Conditions.

ARTICLE 9 – BID SUBMITTAL

9.01 This Bid is submitted by:

If Bidder is:

An Individual

Name (typed or printed): _____

By: _____
(Individual's signature)

Doing business as: _____

A Partnership

Partnership Name: _____

By: _____
(Signature of general partner -- attach evidence of authority to sign)

Name (typed or printed): _____

A Corporation

Corporation Name: _____

State of Incorporation: _____

Type (General Business, Professional, Service, Limited Liability):_____

By: _____
(Signature -- attach evidence of authority to sign)

Name (typed or printed): _____

Title: _____
(CORPORATE SEAL)

Attest _____

Date of Qualification to do business in Connecticut is ____/____/____.

A Joint Venture

Name of Joint Venture: _____

First Joint Venturer Name: _____
(SEAL)

By: _____
(Signature of first joint venture partner - attach evidence of authority to sign)

Name (typed or printed): _____

Title: _____

Second Joint Venturer Name: _____
(SEAL)

By: _____
(Signature of second joint venture partner -- attach evidence of authority to sign)

Name (typed or printed): _____

Title: _____

(Each joint venturer must sign. The manner of signing for each individual, partnership, and corporation that is a party to the joint venture should be in the manner indicated above.)

9.02 Bidder's Business Address _____

_____

Phone No. _____ Fax No. _____

E-mail _____

SUBMITTED on _____, 20____.

BID BOND

Any singular reference to Bidder, Surety, Owner or other party shall be considered plural where applicable.

BIDDER *(Name and Address)*:

SURETY *(Name and Address of Principal Place of Business)*:

OWNER:
Town of Montville
310 Norwich-New London Turnpike
Uncasville, Connecticut 06382

BID
Bid Due Date: _____
Description: **Camp Oakdale Public Works Equipment Storage Garage**

BOND
Bond Number:
Date *(Not earlier than Bid due date)*:
Penal sum _____ $ _____
(Words) (Figures)

Surety and Bidder, intending to be legally bound hereby, subject to the terms set forth below, do each cause this Bid Bond to be duly executed by an authorized officer, agent, or representative.

BIDDER	**SURETY**
_____ (Seal)	_____ (Seal)
Bidder's Name and Corporate Seal	Surety's Name and Corporate Seal
By: _____	By: _____
Signature	Signature (Attach Power of Attorney)
_____	_____
Print Name	Print Name
_____	_____
Title	Title
Attest: _____	Attest: _____
Signature	Signature
_____	_____
Title	Title

Note: Above addresses are to be used for giving any required notice. Provide execution by any additional parties, such as joint venturers, if necessary.

1. Bidder and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to pay to Owner upon default of Bidder the penal sum set forth on the face of this Bond. Payment of the penal sum is the extent of Bidder's and Surety's liability. Recovery of such penal sum under the terms of this Bond shall be Owner's sole and exclusive remedy upon default of Bidder.

2. Default of Bidder shall occur upon the failure of Bidder to deliver within the time required by the Bidding Documents (or any extension thereof agreed to in writing by Owner) the executed Agreement required by the Bidding Documents and any performance and payment bonds required by the Bidding Documents.

3. This obligation shall be null and void if:

3.1 Owner accepts Bidder's Bid and Bidder delivers within the time required by the Bidding Documents (or any extension thereof agreed to in writing by Owner) the executed Agreement required by the Bidding Documents and any performance and payment bonds required by the Bidding Documents, or

3.2 All Bids are rejected by Owner, or

3.3 Owner fails to issue a Notice of Award to Bidder within the time specified in the Bidding Documents (or any extension thereof agreed to in writing by Bidder and, if applicable, consented to by Surety when required by Paragraph 5 hereof).

4. Payment under this Bond will be due and payable upon default of Bidder and within 30 calendar days after receipt by Bidder and Surety of written notice of default from Owner, which notice will be given with reasonable promptness, identifying this Bond and the Project and including a statement of the amount due.

5. Surety waives notice of any and all defenses based on or arising out of any time extension to issue Notice of Award agreed to in writing by Owner and Bidder, provided that the total time for issuing Notice of Award including extensions shall not in the aggregate exceed 120 days from Bid due date without Surety's written consent.

6. No suit or action shall be commenced under this Bond prior to 30 calendar days after the notice of default required in Paragraph 4 above is received by Bidder and Surety and in no case later than one year after Bid due date.

7. Any suit or action under this Bond shall be commenced only in a court of competent jurisdiction located in the state in which the Project is located.

8. Notices required hereunder shall be in writing and sent to Bidder and Surety at their respective addresses shown on the face of this Bond. Such notices may be sent by personal delivery, commercial courier, or by United States Registered or Certified Mail, return receipt requested, postage pre-paid, and shall be deemed to be effective upon receipt by the party concerned.

9. Surety shall cause to be attached to this Bond a current and effective Power of Attorney evidencing the authority of the officer, agent, or representative who executed this Bond on behalf of Surety to execute, seal, and deliver such Bond and bind the Surety thereby.

10. This Bond is intended to conform to all applicable statutory requirements. Any applicable requirement of any applicable statute that has been omitted from this Bond shall be deemed to be included herein as if set forth at length. If any provision of this Bond conflicts with any applicable statute, then the provision of said statute shall govern and the remainder of this Bond that is not in conflict therewith shall continue in full force and effect.

11. The term "Bid" as used herein includes a Bid, offer, or proposal as applicable.

STATEMENT OF BIDDER'S QUALIFICATIONS

All questions must be answered and the data given must be clear and comprehensive. This statement must be notarized. If necessary, questions may be answered on separate attached sheets. The Bidder may submit any additional information he desires.

1. Name of Bidder:

2. Permanent main office address:

3. When organized:

4. If a corporation, where incorporated:

5. How many years have you been engaged in the contracting business under your present firm or trade name?

6. General character of work performed by your company:

7. Have you ever failed to complete any work awarded to you? If so, where and why?

8. Have you ever defaulted on a contract? If so, where and why?

9. List projects similar to this that your organization completed within the last 5 years? The contractor shall attach a summary of such work that identifies:
    - Name of Owner
    - Date of Work
    - Contract Amount
    - Brief Description of Work

10. Experience in construction work similar in importance to this project.

12. Background and experience of the principal members of your organization including the officers.

13. Will you, upon request, fill out a confidential detailed financial statement and furnish any other information that may be required by the OWNER?

14. The undersigned hereby authorizes and requests any person, firm, or corporation to furnish any information requested by the Owner or representative in verification of the recitals comprising this Statement of Bidder's Qualifications.

Dated at _____ this _____ day of _____, 20 ____.

_____
(Name of Bidder)

By _____

Title _____

State of _____)
) ss.
County of _____)

_____ being duly sworn deposes and says that he is _____
_____ of _____
(name of organization)
and that the answers to the foregoing questions and all statements therein contained are true and correct.

Subscribed and sworn to before me this _____ day of _____, 20 ___.

_____
Notary Public

My Commission expires _____ 20 ___.

PROPOSED SUBCONTRACTORS

THE BIDDER SHALL STATE THE NAMES OF ALL THE SUBCONTRACTORS THAT HE PROPOSES TO USE. ATTACH ADDITIONAL SHEETS IF NEEDED.

If none, write "None" _____

*Description of Work _____

Proposed Subcontractor, Name _____

Address _____

*Description of Work _____

Proposed Subcontractor, Name _____

Address _____

*Description of Work _____

Proposed Subcontractor, Name _____

Address _____

*Insert description of work and subcontractors' names as may be required.

This is to certify that all names of the above-mentioned subcontractors are submitted with full knowledge and consent of the respective parties.

The Bidder warrants that none of the proposed subcontractors have any conflict of interest as respects this contract.

Bidder _____
(Fill in Name)

By _____
(Signature and Title)

PROPOSED SUPPLIERS

THE BIDDER SHALL STATE THE NAMES OF PROPOSED MATERIAL SUPPLIERS FOR THE PROJECT. ATTACH ADDITIONAL SHEETS IF NEEDED.

If none, write "None" _____

*Description of Material _____

Proposed Supplier, Name _____

Address _____

*Description of Material _____

Proposed Supplier, Name _____

Address _____

*Description of Material _____

Proposed Supplier, Name _____

Address _____

*Insert description of work and suppliers names as may be required.

This is to certify that all names of the above-mentioned suppliers are submitted with full knowledge and consent of the respective parties.

The Bidder warrants that none of the proposed suppliers have any conflict of interest as respects this contract.

Bidder _____
(Fill in Name)

By _____
(Signature and Title)

NON-COLLUSION AFFIDAVIT OF PRIME BIDDER

State of _____)
) ss.
County of _____)

_____, being first duly sworn, deposes and says that:

(1) He is (owner, partner, officer, representative or agent) of _____ _____, the Bidder that has submitted the attached bid;

(2) He is fully informed respecting the preparation and contents of the attached Bid and of all pertinent circumstances respecting such Bid;

(3) Such Bid is genuine and is not a collusive or sham Bid;

(4) Neither the said Bidder nor any of its officers, partners, owners, agents, representatives, employees or parties in interest, including this affiant, has in any way colluded, conspired, connived or agreed, directly or indirectly with any other Bidder, firm or person to submit a collusive or sham Bid in connection with the Contract for which the attached Bid has been submitted or to refrain from Bidding in connection with such Contract, or has in any manner, directly or indirectly, sought by agreement or collusion or communication or conference with any other Bidder, firm or person to fix the price or prices in the attached Bid or of any other Bidder, or to fix any overhead, profit or cost element of the Bid price or the Bid price of any other Bidder or to secure through any collusion, conspiracy, connivance or unlawful agreement any advantage against the Owner or any person interested in the proposed Contract; and

(5) The price or prices quoted in the attached Bid are fair and proper and are not tainted by any collusion, conspiracy, connivance or unlawful agreement on the part of the Bidder or any of its agents, representatives, owners, employees, or parties in interest, including this affiant.

(Signed) _____

_____
(Title)

Subscribed and sworn to before me
this _____ day of _____ 20 ___.

_____

_____
(Title)
My Commission expires _____ , 20 ____.

NON-DISCRIMINATION IN EMPLOYMENT

State of _____)
) ss
County of _____)

_____, being first duly sworn, deposes and says that:

(1) He is (owner, partner, officer, representative, or agent), of _____ _____, the bidder that has submitted the attached bid;

(2) Said bidder (has _____) (has not _____) previously performed work subject to the President's Executive Order No. 11246, or any preceding similar Executive Order.

Signed _____

_____
Title

Subscribed and Sworn to before me

this _____day of _____20 ___.

_____

_____
Title

My Commission expires _____, 20 ____.

CERTIFICATE AS TO CORPORATE PRINCIPAL

I, _____, certify that I am the Secretary of the corporation named as Principal in the within bond; that _____ _____, who signed the said bond on behalf of the Principal was then _____ of said corporation; that I know his signature, and his signature thereto is genuine; and that said bond was his duly signed, sealed, and attested to for and in behalf of said corporation by authority of this governing body.

(Corporate Seal)

_____

Title: _____

COMMISSION ON HUMAN RIGHTS AND OPPORTUNITIES
CONTRACT COMPLIANCE REGULATIONS
NOTIFICATION TO BIDDERS
(Revised 09/3/15)

The contract to be awarded is subject to contract compliance requirements mandated by Sections 4a-60 and 4a-60a of the Connecticut General Statutes; and, when the awarding agency is the State, Sections 46a-71(d) and 46a-81i(d) of the Connecticut General Statutes. There are Contract Compliance Regulations codified at Section 46a-68j-21 through 43 of the Regulations of Connecticut State Agencies, which establish a procedure for awarding all contracts covered by Sections 4a-60 and 46a-71(d) of the Connecticut General Statutes.

According to Section 46a-68j-30(9) of the Contract Compliance Regulations, every agency awarding a contract subject to the contract compliance requirements has an obligation to "aggressively solicit the participation of legitimate minority business enterprises as bidders, contractors, subcontractors and suppliers of materials." "Minority business enterprise" is defined in Section 4a-60 of the Connecticut General Statutes as a business wherein fifty-one percent or more of the capital stock, or assets belong to a person or persons: "(1) Who are active in daily affairs of the enterprise; (2) who have the power to direct the management and policies of the enterprise; and (3) who are members of a minority, as such term is defined in subsection (a) of Section 32-9n." "Minority" groups are defined in Section 32-9n of the Connecticut General Statutes as "(1) Black Americans . . . (2) Hispanic Americans . . . (3) persons who have origins in the Iberian Peninsula . . . (4)Women . . . (5) Asian Pacific Americans and Pacific Islanders; (6) American Indians . . ." An individual with a disability is also a minority business enterprise as provided by Section 4a-60g of the Connecticut General Statutes. The above definitions apply to the contract compliance requirements by virtue of Section 46a-68j-21(11) of the Contract Compliance Regulations.

The awarding agency will consider the following factors when reviewing the bidder's qualifications under the contract compliance requirements:

(a) the bidder's success in implementing an affirmative action plan;
(b) the bidder's success in developing an apprenticeship program complying with Sections 46a-68-1 to 46a-68-17 of the Administrative Regulations of Connecticut State Agencies, inclusive;
(c) the bidder's promise to develop and implement a successful affirmative action plan;
(d) the bidder's submission of employment statistics contained in the "Employment Information Form", indicating that the composition of its workforce is at or near parity when compared to the racial and sexual composition of the workforce in the relevant labor market area; and
(e) the bidder's promise to set aside a portion of the contract for legitimate minority business enterprises. See Section 46a-68j-30(10)(E) of the Contract Compliance Regulations.

INSTRUCTIONS AND OTHER INFORMATION

The following BIDDER CONTRACT COMPLIANCE MONITORING REPORT must be completed in full, signed, and submitted with the bid for this contract. The contract awarding agency and the Commission on Human Rights and Opportunities will use the information contained thereon to determine the bidders compliance to Sections 4a-60 and 4a-60a CONN. GEN. STAT., and Sections 46a-68j-23 of the Regulations of Connecticut State Agencies regarding equal employment opportunity, and the bidder's good faith efforts to include minority business enterprises as subcontractors and suppliers for the work of the contract.

1) Definition of Small Contractor

Section 4a-60g CONN. GEN. STAT. defines a small contractor as a company that has been doing business under the same management and control and has maintained its principal place of business in Connecticut for a one year period immediately prior to its application for certification under this section, had gross revenues not exceeding fifteen million dollars in the most recently completed fiscal year, and at least fifty-one percent of the ownership of which is held by a person or persons who are active in the daily affairs of the company, and have the power to direct the management and policies of the company, except that a nonprofit corporation shall be construed to be a small contractor if such nonprofit corporation meets the requirements of subparagraphs (A) and (B) of subdivision 4a-60g CONN. GEN. STAT.

MANAGEMENT: Managers plan, organize, direct, and control the major functions of an organization through subordinates who are at the managerial or supervisory level. They make policy decisions and set objectives for the company or departments. They are not usually directly involved in production or providing services. Examples include top executives, public relations managers, managers of operations specialties (such as financial, human resources, or purchasing managers), and construction and engineering managers.

BUSINESS AND FINANCIAL OPERATIONS: These occupations include managers and professionals who work with the financial aspects of the business. These occupations include accountants and auditors, purchasing agents, management analysts, labor relations specialists, and budget, credit, and financial analysts.

MARKETING AND SALES: Occupations related to the act or process of buying and selling products and/or services such as sales engineer, retail sales workers and sales representatives including wholesale.

LEGAL OCCUPATIONS: In-House Counsel who is charged with providing legal advice and services in regards to legal issues that may arise during the course of standard business practices. This category also includes assistive legal occupations such as paralegals, legal assistants.

COMPUTER SPECIALISTS: Professionals responsible for the computer operations within a company are grouped in this category. Examples of job titles in this category include computer programmers, software engineers, database administrators, computer scientists, systems analysts, and computer support specialists

ARCHITECTURE AND ENGINEERING: Occupations related to architecture, surveying, engineering, and drafting are included in this category. Some of the job titles in this category include electrical and electronic engineers, surveyors, architects, drafters, mechanical engineers, materials engineers, mapping technicians, and civil engineers.

OFFICE AND ADMINISTRATIVE SUPPORT: All clerical-type work is included in this category. These jobs involve the preparing, transcribing, and preserving o f written communications and records; collecting accounts; gathering and distributing information; operating office machines and electronic data processing equipment; and distributing mail. Job titles listed in this category include telephone operators, bill and account collectors, customer service representatives, dispatchers, secretaries and administrative assistants, computer operators and clerks (such as payroll, shipping, stock, mail and file).

BUILDING AND GROUNDS CLEANING AND MAINTENANCE: This category includes occupations involving landscaping, housekeeping, and janitorial services. Job titles found in this category include supervisors of landscaping or housekeeping, janitors, maids, grounds maintenance workers, and pest control workers.

CONSTRUCTION AND EXTRACTION: This category includes construction trades and related occupations. Job titles found in this category include boilermakers, masons (all types), carpenters, construction laborers, electricians, plumbers (and related trades), roofers, sheet metal workers, elevator installers, hazardous materials removal workers, paperhangers, and painters. Paving, surfacing, and tamping equipment operators; drywall and ceiling tile installers; and carpet, floor and tile installers and finishers are also included in this category. First line supervisors, foremen, and helpers in these trades are also grouped in this category.

INSTALLATION, MAINTENANCE AND REPAIR: Occupations involving the installation, maintenance, and repair of equipment are included in this group. Examples of job titles found here are heating, ac, and refrigeration mechanics and installers; telecommunication line installers and repairers; heavy vehicle and mobile equipment service technicians and mechanics; small engine mechanics; security and fire alarm systems installers; electric/electronic repair, industrial, utility and transportation equipment; millwrights; riggers; and manufactured building and mobile home installers. First line supervisors, foremen, and helpers for these jobs are also included in the category.

MATERIAL MOVING WORKERS: The job titles included in this group are Crane and tower operators; dredge, excavating, and lading machine operators; hoist and winch operators; industrial truck and tractor operators; cleaners of vehicles and equipment; laborers and freight, stock, and material movers, hand; machine feeders and offbearers; packers and packagers, hand; pumping station operators; refuse and recyclable material collectors; and miscellaneous material moving workers.

PRODUCTION WORKERS: The job titles included in this category are chemical production machine setters, operators and tenders; crushing/grinding workers; cutting workers; inspectors, testers sorters, samplers, weighers; precious stone/metal workers; painting workers; cementing/gluing machine operators and tenders; etchers/engravers; molders, shapers and casters except for metal and plastic; and production workers.

White (not of Hispanic Origin)-All persons having origins in any of the original peoples of Europe, North Africa, or the Middle East. Black (not of Hispanic Origin)-All persons having origins in any of the Black racial groups of Africa. Hispanic- All persons of Mexican, Puerto Rican, Cuban, Central or South American, or other Spanish culture or origin, regardless of race.	Asian or Pacific Islander- All persons having origins in any of the original peoples of the Far East, Southeast Asia, the Indian subcontinent, or the Pacific Islands. This area includes China, India, Japan, Korea, the Philippine Islands, and Samoa. American Indian or Alaskan Native- All persons having origins in any of the original peoples of North America, and who maintain cultural identification through tribal affiliation or community recognition.

BIDDER CONTRACT COMPLIANCE MONITORING REPORT

PART 1 – Bidder Information

Company Name: Street Address: City & State: Chief Executive:	Bidder Federal Employer Identification Number: Or Social Security Number:
Major Business Activity: (brief description)	Bidder Identification (response optional/definitions on page 1) -Bidder is a small contractor? Yes ☐ No ☐ -Bidder is a minority business enterprise? Yes ☐ No ☐ (If yes, check ownership category) Black ☐ Hispanic ☐ Asian American ☐ American Indian/Alaskan Native ☐ Iberian Peninsula ☐ Individual(s) with a Physical Disability ☐ Female ☐ -Bidder is certified as above by State of CT? Yes ☐ No ☐
Bidder Parent Company: (If any)	
Other Locations in CT: (If any)	

PART II - Bidder Nondiscrimination Policies and Procedures

1. Does your company have a written Affirmative Action/Equal Employment Opportunity statement posted on company bulletin boards? Yes ☐ No ☐	7. Do all of your company contracts and purchase orders contain non-discrimination statements as required by Sections 4a-60 & 4a-60a Conn. Gen. Stat.? Yes ☐ No ☐
2. Does your company have the state-mandated sexual harassment prevention in the workplace policy posted on company bulletin boards? Yes ☐ No ☐	8. Do you, upon request, provide reasonable accommodation to employees, or applicants for employment, who have physical or mental disability? Yes ☐ No ☐
3. Do you notify all recruitment sources in writing of your company's Affirmative Action/Equal Employment Opportunity employment policy? Yes ☐ No ☐	9. Does your company have a mandatory retirement age for all employees? Yes ☐ No ☐
4. Do your company advertisements contain a written statement that you are an Affirmative Action/Equal Opportunity Employer? Yes ☐ No ☐	10. If your company has 50 or more employees, have you provided at least two (2) hours of sexual harassment training to all of your supervisors? Yes ☐ No ☐ N/A ☐
5. Do you notify the Ct. State Employment Service of all employment openings with your company? Yes ☐ No ☐	11. If your company has apprenticeship programs, do they meet the Affirmative Action/Equal Employment Opportunity requirements of the apprenticeship standards of the Ct. Dept. of Labor? Yes ☐ No ☐ N/A ☐
6. Does your company have a collective bargaining agreement with workers? Yes ☐ No ☐ 6a. If yes, do the collective bargaining agreements contain non-discrimination clauses covering all workers? Yes ☐ No ☐ 6b. Have you notified each union in writing of your commitments under the nondiscrimination requirements of contracts with the state of CT? Yes ☐ No ☐	12. Does your company have a written affirmative action Plan? Yes ☐ No ☐ If no, please explain. 13. Is there a person in your company who is responsible for equal employment opportunity? Yes ☐ No ☐ If yes, give name and phone number:

1. Will the work of this contract include subcontractors or suppliers? Yes ☐ No ☐

1a. If yes, please list all subcontractors and suppliers and report if they are a small contractor and/or a minority business enterprise. (defined on page 1 / use additional sheet if necessary)

1b. Will the work of this contract require additional subcontractors or suppliers other than those identified in 1a. above? Yes ☐ No ☐

PART IV - Bidder Employment Information Date:

JOB CATEGORY *	OVERALL TOTALS	WHITE (not of Hispanic origin)		BLACK (not of Hispanic origin)		HISPANIC		ASIAN or PACIFIC ISLANDER		AMERICAN INDIAN or ALASKAN NATIVE	
		Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Management											
Business & Financial Ops											
Marketing & Sales											
Legal Occupations											
Computer Specialists											
Architecture/Engineering											
Office & Admin Support											
Bldg/ Grounds Cleaning/Maintenance											
Construction & Extraction											
Installation , Maintenance & Repair											
Material Moving Workers											
Production Occupations											
TOTALS ABOVE											
Total One Year Ago											
FORMAL ON THE JOB TRAINEES (ENTER FIGURES FOR THE SAME CATEGORIES AS ARE SHOWN ABOVE)											
Apprentices											
Trainees											

*NOTE: JOB CATEGORIES CAN BE CHANGED OR ADDED TO (EX. SALES CAN BE ADDED OR REPLACE A CATEGORY NOT USED IN YOUR COMPANY)

1. Which of the following recruitment sources are used by you? (Check yes or no, and report percent used)				2. Check (X) any of the below listed requirements that you use as a hiring qualification (X)		3. Describe below any other practices or actions that you take which show that you hire, train, and promote employees without discrimination
SOURCE	YES	NO	% of applicants provided by source			
State Employment Service	☐	☐			Work Experience	
Private Employment Agencies	☐	☐			Ability to Speak or Write English	
Schools and Colleges	☐	☐			Written Tests	
Newspaper Advertisement	☐	☐			High School Diploma	
Walk Ins	☐	☐			College Degree	
Present Employees	☐	☐			Union Membership	
Labor Organizations	☐	☐			Personal Recommendation	
Minority/Community Organizations	☐	☐			Height or Weight	
Others (please identify)	☐	☐			Car Ownership	
	☐	☐			Arrest Record	
	☐	☐			Wage Garnishments	

Certification (Read this form and check your statements on it CAREFULLY before signing). I certify that the statements made by me on this BIDDER CONTRACT COMPLIANCE MONITORING REPORT are complete and true to the best of my knowledge and belief, and are made in good faith. I understand that if I knowingly make any misstatements of facts, I am subject to be declared in non-compliance with Section 4a-60, 4a-60a, and related sections of the CONN. GEN. STAT.

(Signature)	(Title)	(Date Signed)	(Telephone)

V. AGREEMENT AND BOND FORMS

AGREEMENT BETWEEN OWNER AND CONTRACTOR FOR CONSTRUCTION CONTRACT (STIPULATED PRICE)

THIS AGREEMENT, made this the ___ day of _____ 2024, by and between Town of Montville, Connecticut acting herein through Leonard G. Bunnell Sr., Mayor, hereinafter called "OWNER" and *to be determined* an *individual, a partnership, a corporation* doing business at *to be determined* hereinafter called the "CONTRACTOR".

ARTICLE 1 – WORK

1.01 Contractor shall complete all Work as specified or indicated in the Contract Documents. The Work is generally described as follows: **The design and construction of a new equipment storage building, and all site works as depicted on the Contract Drawings.**

ARTICLE 2 – THE PROJECT

2.01 The Project for which the Work under the Contract Documents may be the whole or only a part is generally described as follows: **Camp Oakdale Public Works Equipment Storage Garage.**

ARTICLE 3 – ENGINEER

3.01 The Project has been designed by CLA Engineers, Inc. (Engineer), which is to act as Owner's representative, assume all duties and responsibilities, and have the rights and authority assigned to Engineer in the Contract Documents in connection with the completion of the Work in accordance with the Contract Documents.

ARTICLE 4 – CONTRACT TIMES

4.01 *Time of the Essence*

A. All time limits for Milestones, if any, Substantial Completion, and completion and readiness for final payment as stated in the Contract Documents are of the essence of the Contract.

4.02 *Days to Achieve Substantial Completion and Final Payment*

A. The Work shall be substantially completed by within **120** days after the date when the Contract Times commence to run as provided in Paragraph 2.03 of the General Conditions and completed and ready for final payment in accordance with Paragraph 14.07 of the General Conditions within **150** days after the date when the Contract Times commence to run.

B. The Owner may suspend the contract time if weather conditions warrant.

4.03 *Liquidated Damages*

A. Contractor and Owner recognize that time is of the essence as stated in Paragraph 4.01 above and that Owner will suffer financial loss if the Work is not completed within the times specified in Paragraph 4.02 above, plus any extensions thereof allowed in accordance with Article 12 of the General Conditions. The parties also recognize the delays, expense, and difficulties involved in proving in a legal or arbitration proceeding the actual loss suffered by Owner if the Work is not completed on time. Accordingly, instead of requiring any such proof, Owner and Contractor agree that as liquidated damages for delay (but not as a penalty), Contractor shall pay Owner **$1,000.00** for each day that expires after the time specified in Paragraph 4.02 above for Substantial Completion until the Work is substantially complete. After Substantial Completion, if Contractor shall neglect, refuse, or fail to complete the remaining Work within the Contract Time or any proper extension thereof granted by Owner, Contractor shall pay Owner **$1,000.00** for each day that expires after the time specified in Paragraph 4.02 above for completion and readiness for final payment until the Work is completed and ready for final payment.

ARTICLE 5 – CONTRACT PRICE

5.01 Owner shall pay Contractor for completion of the Work in accordance with the Contract Documents an amount in current funds equal to the sum of the amounts determined pursuant to Paragraphs 5.01.A, 5.01.B, and 5.01.C below:

A. For all Work other than Unit Price Work, a lump sum of: $ *Not Applicable*

All specific cash allowances are included in the above price in accordance with Paragraph 11.02 of the General Conditions.

B. For all Unit Price Work, an amount equal to the sum of the established unit price for each separately identified item of Unit Price Work times the actual quantity of that item:

UNIT PRICE WORK

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	AMOUNT
(to be determined by bid)					

Total of Bid Unit Prices (Unit Price Work): $_____

The Bid prices for Unit Price Work set forth as of the Effective Date of the Agreement are based on estimated quantities. As provided in Paragraph 11.03 of the General Conditions, estimated quantities are not guaranteed, and determinations of actual quantities and classifications are to be made by Engineer as provided in Paragraph 9.07 of the General Conditions.

ARTICLE 6 – PAYMENT PROCEDURES

6.01 *Submittal and Processing of Payments*

A. Contractor shall submit Applications for Payment in accordance with Article 14 of the General Conditions. Applications for Payment will be processed by Engineer as provided in the General Conditions.

6.02 *Progress Payments; Retainage*

A. Owner shall make progress payments on account of the Contract Price on the basis of Contractor's Applications for Payment on or about the Last day of each month during performance of the Work as provided in Paragraph 6.02.A.1 below. All such payments will be measured by the schedule of values established as provided in Paragraph 2.07.A of the General Conditions (and in the case of Unit Price Work based on the number of units completed) or, in the event there is no schedule of values, as provided in the General Requirements.

1. Prior to Substantial Completion, progress payments will be made in an amount equal to the percentage indicated below but, in each case, less the aggregate of payments previously made and less such amounts as Engineer may determine or Owner may withhold, including but not limited to liquidated damages, in accordance with Paragraph 14.02 of the General Conditions.

a. 95 percent of Work completed (with the balance being retainage). If the Work has been 50 percent completed as determined by Engineer, and if the character and progress of the Work have been satisfactory to Owner and Engineer, then as long as the character and progress of the Work remain satisfactory to Owner and Engineer, there will be no additional retainage; and

b. 0 percent of cost of materials and equipment not incorporated in the Work (with the balance being retainage).

B. Upon Substantial Completion, Owner shall pay an amount sufficient to increase total payments to Contractor to 98 percent of the Work completed, less such amounts as Engineer shall determine in accordance with Paragraph 14.02.B.5 of the General Conditions and less 200 percent of Engineer's estimate of the value of Work to be completed or corrected as shown on the tentative list of items to be completed or corrected attached to the certificate of Substantial Completion.

6.03 *Final Payment*

A. Upon final completion and acceptance of the Work in accordance with Paragraph 14.07 of the General Conditions, Owner shall pay the remainder of the Contract Price (with the exception of 2 percent that shall be held by the Owner for a 6 month period) as recommended by Engineer as provided in said Paragraph 14.07. The 2 percent retainage shall be released by the Owner after 6 months if final work has remained in acceptable condition.

ARTICLE 7 – INTEREST

7.01 All moneys not paid when due as provided in Article 14 of the General Conditions shall bear interest at the rate of 0 percent per annum.

ARTICLE 8 – CONTRACTOR'S REPRESENTATIONS

8.01 In order to induce Owner to enter into this Agreement, Contractor makes the following representations:

A. Contractor has examined and carefully studied the Contract Documents and the other related data identified in the Bidding Documents.

B. Contractor has visited the Site and become familiar with and is satisfied as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work.

C. Contractor is familiar with and is satisfied as to all federal, state, and local Laws and Regulations that may affect cost, progress, and performance of the Work.

D. Not Applicable

E. Contractor has considered the information known to Contractor; information commonly known to contractors doing business in the locality of the Site; information and observations obtained from visits to the Site; the Contract Documents; and drawings identified in the Contract Documents, with respect to the effect of such information, observations, and documents on (1) the cost, progress, and performance of the Work; (2) the means, methods, techniques, sequences, and procedures of construction to be employed by Contractor, including any specific means, methods, techniques, sequences, and procedures of construction expressly required by the Contract Documents; and (3) Contractor's safety precautions and programs.

F. Based on the information and observations referred to in Paragraph 8.01.E above, Contractor does not consider that further examinations, investigations, explorations, tests, studies, or data are necessary for the performance of the Work at the Contract Price, within the Contract Times, and in accordance with the other terms and conditions of the Contract Documents.

G. Contractor is aware of the general nature of work to be performed by Owner and others at the Site that relates to the Work as indicated in the Contract Documents.

H. Contractor has given Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Contractor has discovered in the Contract Documents, and the written resolution thereof by Engineer is acceptable to Contractor.

I. The Contract Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performance and furnishing of the Work.

J. The Contractor and all subcontractors will comply with Executive Order No. Three, Executive Order No. Sixteen and Executive Order No. Seventeen, Office of Federal

Contract Compliance Programs (OFCC) Executive Order No. 11246, Executive Order 12549 and CGS 31-53a, and federal regulation 2 CFR 200.216 as amended.

K. Non-Discrimination and Affirmative Action Provisions

(A) (1) The contractor agrees and warrants that in the performance of the contract such contractor will not discriminate or permit discrimination against any person or group of persons on the grounds of race, color, religious creed, age, marital status, national origin, ancestry, sex, gender identity or expression, status as a veteran, intellectual disability, mental disability or physical disability, including, but not limited to, blindness, unless it is shown by such contractor that such disability prevents performance of the work involved, in any manner prohibited by the laws of the United States or of the state of Connecticut; and the contractor further agrees to take affirmative action to ensure that applicants with job-related qualifications are employed and that employees are treated when employed without regard to their race, color, religious creed, age, marital status, national origin, ancestry, sex, gender identity or expression, status as a veteran, intellectual disability, mental disability or physical disability, including, but not limited to, blindness, unless it is shown by such contractor that such disability prevents performance of the work involved; (2) The contractor agrees, in all solicitations or advertisements for employees placed by or on behalf of the contractor, to state that it is an "affirmative action-equal opportunity employer" in accordance with regulations adopted by the Commission on Human Rights and Opportunities; (3) The contractor agrees to provide each labor union or representative of workers with which such contractor has a collective bargaining agreement or other contract or understanding and each vendor with which such contractor has a contract or understanding, a notice to be provided by the Commission on Human Rights and Opportunities advising the labor union or workers' representative of the contractor's commitments under this section, and to post copies of the notice in conspicuous places available to employees and applicants for employment; (4) The contractor agrees to comply with each provision of this section and sections 46a-68e and 46a-68f and with each regulation or relevant order issued by said commission pursuant to sections 46a-56, 46a-68e, 46a-68f and 46a-86; and (5) The contractor agrees to provide the Commission on Human Rights and Opportunities with such information requested by the commission, and permit access to pertinent books, records and accounts, concerning the employment practices and procedures of the contractor as relate to the provisions of this section and section 46a-56.

(B) The contractor agrees and warrants that he or she will make good faith efforts to employ minority business enterprises as subcontractors and suppliers of materials on the project.

(C) For the purposes of this section, "contract" includes any extension or modification of the contract, "contractor" includes any successors or assigns of the contractor, "marital status" means being single, married as recognized by the state of Connecticut, widowed, separated or divorced, and "mental disability" means one or more mental disorders, as defined in the most recent edition of the American

Psychiatric Association's "Diagnostic and Statistical Manual of Mental Disorders", or a record of or regarding a person as having one or more such disorders. For the purposes of this section, "contract" does not include a contract where each contractor is (1) a political subdivision of the state, including, but not limited to, a municipality, unless the contract is a municipal public works contract or quasi-public agency project contract, (2) any other state, as defined in section 1- 267, (3) the federal government, (4) a foreign government, or (5) an agency of a subdivision, state or government described in subdivision (1), (2), (3) or (4) of this subsection.

(D) For the purposes of this section, "minority business enterprise" means any small contractor or supplier of materials fifty-one per cent or more of the capital stock, if any, or assets of which is owned by a person or persons: (1) Who are active in the daily affairs of the enterprise, (2) who have the power to direct the management and policies of the enterprise, and (3) who are members of a minority, as such term is defined in subsection (a) of section 32-9n of the Connecticut General Statutes; and "good faith" means that degree of diligence which a reasonable person would exercise in the performance of legal duties and obligations. "Good faith efforts" shall include, but not be limited to, those reasonable initial efforts necessary to comply with statutory or regulatory requirements and additional or substituted efforts when it is determined that such initial efforts will not be sufficient to comply with such requirements.

(E) The contractor shall develop and maintain adequate documentation, in a manner prescribed by the Commission on Human Rights and Opportunities, of its good faith efforts.

(F) The contractor shall include the provisions of subsections (a) and (b) of this section in every subcontract or purchase order entered into in order to fulfill any obligation of a contract with the state, and in every subcontract entered into in order to fulfill any obligation of a municipal public works contract or contract for a quasi-public agency project, and such provisions shall be binding on a subcontractor, vendor or manufacturer, unless exempted by regulations or orders of the Commission on Human Rights and Opportunities. The contractor shall take such action with respect to any such subcontract or purchase order as the commission may direct as a means of enforcing such provisions, including sanctions for noncompliance in accordance with section 46a- 56; provided, if such contractor becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction by the commission regarding a state contract, the contractor may request the state of Connecticut to enter into any such litigation or negotiation prior thereto to protect the interests of the state and the state may so enter.

ARTICLE 9 – CONTRACT DOCUMENTS

9.01 *Contents*

A. The Contract Documents consist of the following:

1. This Agreement (pages 1 to __, inclusive).

2. Performance bond (pages _____ to _____, inclusive).

3. Payment bond (pages _____ to _____, inclusive).

4. Instructions to Bidders (pages 1 to 14, inclusive)

5. General Conditions (pages 1 to 48, inclusive).

6. Supplementary Conditions (pages 1 to 13, inclusive).

7. Specifications as listed in the table of contents of the Project Manual.

8. Drawings consisting of _____ sheets with each sheet bearing the following general title: Camp Oakdale Public Works Equipment Storage Building.

9. Addenda (numbers _____ to _____, inclusive).

10. Exhibits to this Agreement (enumerated as follows):

    a. Contractor's Bid (pages _____ to _____, inclusive).

    b. Documentation submitted by Contractor prior to Notice of Award (pages _____ to _____, inclusive).

11. The following which may be delivered or issued on or after the Effective Date of the Agreement and are not attached hereto:

    a. Notice to Proceed (pages _____ to _____, inclusive).

    b. Work Change Directives.

    c. Change Orders.

B. The documents listed in Paragraph 9.01.A are attached to this Agreement (except as expressly noted otherwise above).

C. There are no Contract Documents other than those listed above in this Article 9.

D. The Contract Documents may only be amended, modified, or supplemented as provided in Paragraph 3.04 of the General Conditions.

ARTICLE 10 – MISCELLANEOUS

10.01 *Terms*

A. Terms used in this Agreement will have the meanings stated in the General Conditions and the Supplementary Conditions.

10.02 *Assignment of Contract*

A. No assignment by a party hereto of any rights under or interests in the Contract will be binding on another party hereto without the written consent of the party sought to be bound; and, specifically but without limitation, moneys that may become due and moneys that are due may not be assigned without such consent (except to the extent that the effect of this restriction may be limited by law), and unless specifically stated to the contrary in any written consent to an assignment, no assignment will release or discharge the assignor from any duty or responsibility under the Contract Documents.

10.03 *Successors and Assigns*

A. Owner and Contractor each binds itself, its partners, successors, assigns, and legal representatives to the other party hereto, its partners, successors, assigns, and legal representatives in respect to all covenants, agreements, and obligations contained in the Contract Documents.

10.04 *Severability*

A. Any provision or part of the Contract Documents held to be void or unenforceable under any Law or Regulation shall be deemed stricken, and all remaining provisions shall continue to be valid and binding upon Owner and Contractor, who agree that the Contract Documents shall be reformed to replace such stricken provision or part thereof with a valid and enforceable provision that comes as close as possible to expressing the intention of the stricken provision.

10.05 *Contractor's Certifications*

A. Contractor certifies that it has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for or in executing the Contract. For the purposes of this Paragraph 10.05:

1. "corrupt practice" means the offering, giving, receiving, or soliciting of anything of value likely to influence the action of a public official in the bidding process or in the Contract execution;

2. "fraudulent practice" means an intentional misrepresentation of facts made (a) to influence the bidding process or the execution of the Contract to the detriment of Owner, (b) to establish Bid or Contract prices at artificial non-competitive levels, or (c) to deprive Owner of the benefits of free and open competition;

3. "collusive practice" means a scheme or arrangement between two or more Bidders, with or without the knowledge of Owner, a purpose of which is to establish Bid prices at artificial, non-competitive levels; and

4. "coercive practice" means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in the bidding process or affect the execution of the Contract.

IN WITNESS WHEREOF, Owner and Contractor have signed this Agreement. Counterparts have been delivered to Owner and Contractor. All portions of the Contract Documents have been signed or have been identified by Owner and Contractor or on their behalf.

This Agreement will be effective on _____ (which is the Effective Date of the Agreement).

OWNER:	CONTRACTOR
Town of Montville	
By:	By:
Title: Mayor	Title:
	(If Contractor is a corporation, a partnership, or a joint venture, attach evidence of authority to sign.)
Attest:	Attest:
Title:	Title:
Address for giving notices:	Address for giving notices:
Town of Montville	
310 Norwich – New London Turnpike	
Montville, Connecticut 06382	
	License No.:
	(Where applicable)
(If Owner is a corporation, attach evidence of authority to sign. If Owner is a public body, attach evidence of authority to sign and resolution or other documents authorizing execution of this Agreement.)	Agent for service of process:

PERFORMANCE BOND

Any singular reference to Contractor, Surety, Owner, or other party shall be considered plural where applicable.

CONTRACTOR (*Name and Address*):

SURETY (*Name, and Address of Principal Place of Business*):

OWNER (*Name and Address*):
Town of Montville
310 Norwich – New London Turnpike
Montville, Connecticut 06382

CONTRACT
Effective Date of Agreement:
Amount:
Description (*Name and Location*): **Camp Oakdale Public Works Equipment Storage Garage**

BOND
Bond Number:
Date (*Not earlier than Effective Date of Agreement*):
Amount:
Modifications to this Bond Form:

Surety and Contractor, intending to be legally bound hereby, subject to the terms set forth below, do each cause this Performance Bond to be duly executed by an authorized officer, agent, or representative.

CONTRACTOR AS PRINCIPAL	**SURETY**
_____ (Seal)	_____ (Seal)
Contractor's Name and Corporate Seal	Surety's Name and Corporate Seal
By: _____	By: _____
Signature	Signature (Attach Power of Attorney)
_____	_____
Print Name	Print Name
_____	_____
Title	Title
Attest: _____	Attest: _____
Signature	Signature
_____	_____
Title	Title

Note: Provide execution by additional parties, such as joint venturers, if necessary.

Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to Owner for the performance of the Contract, which is incorporated herein by reference.

1. If Contractor performs the Contract, Surety and Contractor have no obligation under this Bond, except to participate in conferences as provided in Paragraph 2.1.

2. If there is no Owner Default, Surety's obligation under this Bond shall arise after:
   2.1 Owner has notified Contractor and Surety, at the addresses described in Paragraph 9 below, that Owner is considering declaring a Contractor Default and has requested and attempted to arrange a conference with Contractor and Surety to be held not later than 15 days after receipt of such notice to discuss methods of performing the Contract. If Owner, Contractor, and Surety agree, Contractor shall be allowed a reasonable time to perform the Contract, but such an agreement shall not waive Owner's right, if any, subsequently to declare a Contractor Default; and
   2.2 Owner has declared a Contractor Default and formally terminated Contractor's right to complete the Contract. Such Contractor Default shall not be declared earlier than 20 days after Contractor and Surety have received notice as provided in Paragraph 2.1; and
   2.3 Owner has agreed to pay the Balance of the Contract Price to:
      1. Surety in accordance with the terms of the Contract; or
      2. Another contractor selected pursuant to Paragraph 3.3 to perform the Contract.

3. When Owner has satisfied the conditions of Paragraph 2, Surety shall promptly, and at Surety's expense, take one of the following actions:

   3.1 Arrange for Contractor, with consent of Owner, to perform and complete the Contract; or
   3.2 Undertake to perform and complete the Contract itself, through its agents or through independent contractors; or
   3.3 Obtain bids or negotiated proposals from qualified contractors acceptable to Owner for a contract for performance and completion of the Contract, arrange for a contract to be prepared for execution by Owner and contractor selected with Owner's concurrence, to be secured with performance and payment bonds executed by a qualified surety equivalent to the bonds issued on the Contract, and pay to Owner the amount of damages as described in Paragraph 5 in excess of the Balance of the Contract Price incurred by Owner resulting from Contractor Default; or
   3.4 Waive its right to perform and complete, arrange for completion, or obtain a new contractor, and with reasonable promptness under the circumstances:
      1. After investigation, determine the amount for which it may be liable to Owner and, as soon as practicable after the amount is determined, tender payment therefor to Owner; or
      2. Deny liability in whole or in part and notify Owner citing reasons therefor.

4. If Surety does not proceed as provided in Paragraph 3 with reasonable promptness, Surety shall be deemed to be in default on this Bond 15 days after receipt of an additional written notice from Owner to Surety demanding that Surety perform its obligations under this Bond, and Owner shall be entitled to enforce any remedy available to Owner. If Surety proceeds as provided in Paragraph 3.4, and Owner refuses the payment tendered or Surety has denied liability, in whole or in part, without further notice Owner shall be entitled to enforce any remedy available to Owner.

5. After Owner has terminated Contractor's right to complete the Contract, and if Surety elects to act under Paragraph 3.1, 3.2, or 3.3 above, then the responsibilities of Surety to Owner shall not be greater than those of Contractor under the Contract, and the responsibilities of Owner to Surety shall not be greater than those of Owner under the Contract. To the limit of the amount of this Bond, but subject to commitment by Owner of the Balance of the Contract Price to mitigation of costs and damages on the Contract, Surety is obligated without duplication for:

5.1 The responsibilities of Contractor for correction of defective Work and completion of the Contract;
5.2 Additional legal, design professional, and delay costs resulting from Contractor's Default, and resulting from the actions of or failure to act of Surety under Paragraph 3; and
5.3 Liquidated damages, or if no liquidated damages are specified in the Contract, actual damages caused by delayed performance or non-performance of Contractor.

6. Surety shall not be liable to Owner or others for obligations of Contractor that are unrelated to the Contract, and the Balance of the Contract Price shall not be reduced or set off on account of any such unrelated obligations. No right of action shall accrue on this Bond to any person or entity other than Owner or its heirs, executors, administrators, or successors.

7. Surety hereby waives notice of any change, including changes of time, to Contract or to related subcontracts, purchase orders, and other obligations.

8. Any proceeding, legal or equitable, under this Bond may be instituted in any court of competent jurisdiction in the location in which the Work or part of the Work is located, and shall be instituted within two years after Contractor Default or within two years after Contractor ceased working or within two years after Surety refuses or fails to perform its obligations under this Bond, whichever occurs first. If the provisions of this paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.

9. Notice to Surety, Owner, or Contractor shall be mailed or delivered to the address shown on the signature page.

10. When this Bond has been furnished to comply with a statutory requirement in the location where the Contract was to be performed, any provision in this Bond conflicting with said statutory requirement shall be deemed deleted herefrom and provisions conforming to such statutory requirement shall be deemed incorporated herein. The intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

11. Definitions.

11.1 Balance of the Contract Price: The total amount payable by Owner to Contractor under the Contract after all proper adjustments have been made, including allowance to Contractor of any amounts received or to be received by Owner in settlement of insurance or other Claims for damages to which Contractor is entitled, reduced by all valid and proper payments made to or on behalf of Contractor under the Contract.
11.2 Contract: The agreement between Owner and Contractor identified on the signature page, including all Contract Documents and changes thereto.
11.3 Contractor Default: Failure of Contractor, which has neither been remedied nor waived, to perform or otherwise to comply with the terms of the Contract.
11.4 Owner Default: Failure of Owner, which has neither been remedied nor waived, to pay Contractor as required by the Contract or to perform and complete or otherwise comply with the other terms thereof.

FOR INFORMATION ONLY – (*Name, Address and Telephone*) Surety Agency or Broker: Owner's Representative (*Engineer or other party*):

PAYMENT BOND

Any singular reference to Contractor, Surety, Owner, or other party shall be considered plural where applicable.

CONTRACTOR (*Name and Address*):

SURETY (*Name, and Address of Principal Place of Business*):

OWNER (*Name and Address*):
Town of Montville
310 Norwich – New London Turnpike
Uncasville, Connecticut 06382

CONTRACT
Effective Date of Agreement:
Amount:
Description *(Name and Location)*: **Camp Oakdale Public Works Equipment Storage Garage**

BOND
Bond Number:
Date (*Not earlier than Effective Date of Agreement*):
Amount:
Modifications to this Bond Form:

Surety and Contractor, intending to be legally bound hereby, subject to the terms set forth below, do each cause this Payment Bond to be duly executed by an authorized officer, agent, or representative.

CONTRACTOR AS PRINCIPAL	**SURETY**
_____ (Seal)	_____ (Seal)
Contractor's Name and Corporate Seal	Surety's Name and Corporate Seal
By: _____	By: _____
Signature	Signature (Attach Power of Attorney)
_____	_____
Print Name	Print Name
_____	_____
Title	Title
Attest: _____	Attest: _____
Signature	Signature
_____	_____
Title	Title

Note: Provide execution by additional parties, such as joint venturers, if necessary.

1. Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to Owner to pay for labor, materials, and equipment furnished by Claimants for use in the performance of the Contract, which is incorporated herein by reference.

2. With respect to Owner, this obligation shall be null and void if Contractor:

2.1 Promptly makes payment, directly or indirectly, for all sums due Claimants, and

2.2 Defends, indemnifies, and holds harmless Owner from all claims, demands, liens, or suits alleging non-payment by Contractor by any person or entity who furnished labor, materials, or equipment for use in the performance of the Contract, provided Owner has promptly notified Contractor and Surety (at the addresses described in Paragraph 12) of any claims, demands, liens, or suits and tendered defense of such claims, demands, liens, or suits to Contractor and Surety, and provided there is no Owner Default.

3. With respect to Claimants, this obligation shall be null and void if Contractor promptly makes payment, directly or indirectly, for all sums due.

4. Surety shall have no obligation to Claimants under this Bond until:

4.1 Claimants who are employed by or have a direct contract with Contractor have given notice to Surety (at the address described in Paragraph 12) and sent a copy, or notice thereof, to Owner, stating that a claim is being made under this Bond and, with substantial accuracy, the amount of the claim.

4.2 Claimants who do not have a direct contract with Contractor:

1. Have furnished written notice to Contractor and sent a copy, or notice thereof, to Owner, within 90 days after having last performed labor or last furnished materials or equipment included in the claim stating, with substantial accuracy, the amount of the claim and the name of the party to whom the materials or equipment were furnished or supplied, or for whom the labor was done or performed; and
2. Have either received a rejection in whole or in part from Contractor, or not received within 30 days of furnishing the above notice any communication from Contractor by which Contractor had indicated the claim will be paid directly or indirectly; and
3. Not having been paid within the above 30 days, have sent a written notice to Surety (at the address described in Paragraph 12) and sent a copy, or notice thereof, to Owner, stating that a claim is being made under this Bond and enclosing a copy of the previous written notice furnished to Contractor.

5. If a notice by a Claimant required by Paragraph 4 is provided by Owner to Contractor or to Surety, that is sufficient compliance.

6. Reserved.

7. Surety's total obligation shall not exceed the amount of this Bond, and the amount of this Bond shall be credited for any payments made in good faith by Surety.

8. Amounts owed by Owner to Contractor under the Contract shall be used for the performance of the Contract and to satisfy claims, if any, under any performance bond. By Contractor furnishing and Owner accepting this Bond, they agree that all funds earned by Contractor in the performance of the Contract are dedicated to satisfy obligations of Contractor and Surety under this Bond, subject to Owner's priority to use the funds for the completion of the Work.

9. Surety shall not be liable to Owner, Claimants, or others for obligations of Contractor that are unrelated to the Contract. Owner shall not be liable for payment of any costs or expenses of any Claimant under this Bond, and shall have under this Bond no obligations to make payments to, give notices on behalf of, or otherwise have obligations to Claimants under this Bond.

10. Surety hereby waives notice of any change, including changes of time, to the Contract or to related subcontracts, purchase orders, and other obligations.

11. No suit or action shall be commenced by a Claimant under this Bond other than in a court of competent jurisdiction in the location in which the Work or part of the Work is located or after the expiration of one year from the date (1) on which the Claimant gave the notice required by Paragraph 4.1 or Paragraph 4.2.3, or (2) on which the last labor or service was performed by anyone or the last materials or equipment were furnished by anyone under the Contract, whichever of (1) or (2) first occurs. If the provisions of this paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.

12. Notice to Surety, Owner, or Contractor shall be mailed or delivered to the addresses shown on the signature page. Actual receipt of notice by Surety, Owner, or Contractor, however accomplished, shall be sufficient compliance as of the date received at the address shown on the signature page.

13. When this Bond has been furnished to comply with a statutory requirement in the location where the Contract was to be performed, any provision in this Bond conflicting with said statutory requirement shall be deemed deleted herefrom and provisions conforming to such statutory requirement shall be deemed incorporated herein. The intent is that this Bond shall be construed as a statutory Bond and not as a common law bond.

14. Upon request of any person or entity appearing to be a potential beneficiary of this Bond, Contractor shall promptly furnish a copy of this Bond or shall permit a copy to be made.

15. Definitions

15.1 Claimant: An individual or entity having a direct contract with Contractor, or with a first-tier subcontractor of Contractor, to furnish labor, materials, or equipment for use in the performance of the Contract. The intent of this Bond shall be to include without limitation in the terms "labor, materials or equipment" that part of water, gas, power, light, heat, oil, gasoline, telephone service, or rental equipment used in the Contract, architectural and engineering services required for performance of the Work of Contractor and Contractor's subcontractors, and all other items for which a mechanic's lien may be asserted in the jurisdiction where the labor, materials, or equipment were furnished.

15.2 Contract: The agreement between Owner and Contractor identified on the signature page, including all Contract Documents and changes thereto.

15.3 Owner Default: Failure of Owner, which has neither been remedied nor waived, to pay Contractor as required by the Contract, or to perform and complete or otherwise comply with the other terms thereof.

FOR INFORMATION ONLY – (*Name, Address, and Telephone*) Surety Agency or Broker: Owner's Representative (*Engineer or other*):

VI. STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

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ARTICLE 1 – DEFINITIONS AND TERMINOLOGY

1.01 *Defined Terms*

A. Wherever used in the Bidding Requirements or Contract Documents and printed with initial capital letters, the terms listed below will have the meanings indicated which are applicable to both the singular and plural thereof. In addition to terms specifically defined, terms with initial capital letters in the Contract Documents include references to identified articles and paragraphs, and the titles of other documents or forms.

1. *Addenda*—Written or graphic instruments issued prior to the opening of Bids which clarify, correct, or change the Bidding Requirements or the proposed Contract Documents.

2. *Agreement*—The written instrument which is evidence of the agreement between Owner and Contractor covering the Work.

3. *Application for Payment*—The form acceptable to Engineer which is to be used by Contractor during the course of the Work in requesting progress or final payments and which is to be accompanied by such supporting documentation as is required by the Contract Documents.

4. *Asbestos*—Any material that contains more than one percent asbestos and is friable or is releasing asbestos fibers into the air above current action levels established by the United States Occupational Safety and Health Administration.

5. *Bid*—The offer or proposal of a Bidder submitted on the prescribed form setting forth the prices for the Work to be performed.

6. *Bidder*—The individual or entity who submits a Bid directly to Owner.

7. *Bidding Documents*—The Bidding Requirements and the proposed Contract Documents (including all Addenda).

8. *Bidding Requirements*—The advertisement or invitation to bid, Instructions to Bidders, Bid security of acceptable form, if any, and the Bid Form with any supplements.

9. *Change Order*—A document recommended by Engineer which is signed by Contractor and Owner and authorizes an addition, deletion, or revision in the Work or an adjustment in the Contract Price or the Contract Times, issued on or after the Effective Date of the Agreement.

10. *Claim*—A demand or assertion by Owner or Contractor seeking an adjustment of Contract Price or Contract Times, or both, or other relief with respect to the terms of the Contract. A demand for money or services by a third party is not a Claim.

11. *Contract*—The entire and integrated written agreement between the Owner and Contractor concerning the Work. The Contract supersedes prior negotiations, representations, or agreements, whether written or oral.

12. *Contract Documents*—Those items so designated in the Agreement. Only printed or hard copies of the items listed in the Agreement are Contract Documents. Approved Shop Drawings, other Contractor submittals, and the reports and drawings of subsurface and physical conditions are not Contract Documents.

13. *Contract Price*—The moneys payable by Owner to Contractor for completion of the Work in accordance with the Contract Documents as stated in the Agreement (subject to the provisions of Paragraph 11.03 in the case of Unit Price Work).

14. *Contract Times*—The number of days or the dates stated in the Agreement to: (i) achieve Milestones, if any; (ii) achieve Substantial Completion; and (iii) complete the Work so that it is ready for final payment as evidenced by Engineer's written recommendation of final payment.

15. *Contractor*—The individual or entity with whom Owner has entered into the Agreement.

16. *Cost of the Work*—See Paragraph 11.01 for definition.

17. *Drawings*—That part of the Contract Documents prepared or approved by Engineer which graphically shows the scope, extent, and character of the Work to be performed by Contractor. Shop Drawings and other Contractor submittals are not Drawings as so defined.

18. *Effective Date of the Agreement*—The date indicated in the Agreement on which it becomes effective, but if no such date is indicated, it means the date on which the Agreement is signed and delivered by the last of the two parties to sign and deliver.

19. *Engineer*—The individual or entity named as such in the Agreement.

20. *Field Order*—A written order issued by Engineer which requires minor changes in the Work but which does not involve a change in the Contract Price or the Contract Times.

21. *General Requirements*—Sections of Division 1 of the Specifications.

22. *Hazardous Environmental Condition*—The presence at the Site of Asbestos, PCBs, Petroleum, Hazardous Waste, or Radioactive Material in such quantities or circumstances that may present a substantial danger to persons or property exposed thereto.

23. *Hazardous Waste*—The term Hazardous Waste shall have the meaning provided in Section 1004 of the Solid Waste Disposal Act (42 USC Section 6903) as amended from time to time.

24. *Laws and Regulations; Laws or Regulations*—Any and all applicable laws, rules, regulations, ordinances, codes, and orders of any and all governmental bodies, agencies, authorities, and courts having jurisdiction.

25. *Liens*—Charges, security interests, or encumbrances upon Project funds, real property, or personal property.

26. *Milestone*—A principal event specified in the Contract Documents relating to an intermediate completion date or time prior to Substantial Completion of all the Work.

27. *Notice of Award*—The written notice by Owner to the Successful Bidder stating that upon timely compliance by the Successful Bidder with the conditions precedent listed therein, Owner will sign and deliver the Agreement.

28. *Notice to Proceed*—A written notice given by Owner to Contractor fixing the date on which the Contract Times will commence to run and on which Contractor shall start to perform the Work under the Contract Documents.

29. *Owner*—The individual or entity with whom Contractor has entered into the Agreement and for whom the Work is to be performed.

30. *PCBs*—Polychlorinated biphenyls.

31. *Petroleum*—Petroleum, including crude oil or any fraction thereof which is liquid at standard conditions of temperature and pressure (60 degrees Fahrenheit and 14.7 pounds per square inch absolute), such as oil, petroleum, fuel oil, oil sludge, oil refuse, gasoline, kerosene, and oil mixed with other non-Hazardous Waste and crude oils.

32. *Progress Schedule*—A schedule, prepared and maintained by Contractor, describing the sequence and duration of the activities comprising the Contractor's plan to accomplish the Work within the Contract Times.

33. *Project*—The total construction of which the Work to be performed under the Contract Documents may be the whole, or a part.

34. *Project Manual*—The bound documentary information prepared for bidding and constructing the Work. A listing of the contents of the Project Manual, which may be bound in one or more volumes, is contained in the table(s) of contents.

35. *Radioactive Material*—Source, special nuclear, or byproduct material as defined by the Atomic Energy Act of 1954 (42 USC Section 2011 et seq.) as amended from time to time.

36. *Resident Project Representative*—The authorized representative of Engineer who may be assigned to the Site or any part thereof.

37. *Samples*—Physical examples of materials, equipment, or workmanship that are representative of some portion of the Work and which establish the standards by which such portion of the Work will be judged.

38. *Schedule of Submittals*—A schedule, prepared and maintained by Contractor, of required submittals and the time requirements to support scheduled performance of related construction activities.

39. *Schedule of Values*—A schedule, prepared and maintained by Contractor, allocating portions of the Contract Price to various portions of the Work and used as the basis for reviewing Contractor's Applications for Payment.

40. *Shop Drawings*—All drawings, diagrams, illustrations, schedules, and other data or information which are specifically prepared or assembled by or for Contractor and submitted by Contractor to illustrate some portion of the Work.

41. *Site*—Lands or areas indicated in the Contract Documents as being furnished by Owner upon which the Work is to be performed, including rights-of-way and easements for access thereto, and such other lands furnished by Owner which are designated for the use of Contractor.

42. *Specifications*—That part of the Contract Documents consisting of written requirements for materials, equipment, systems, standards and workmanship as applied to the Work, and certain administrative requirements and procedural matters applicable thereto.

43. *Subcontractor*—An individual or entity having a direct contract with Contractor or with any other Subcontractor for the performance of a part of the Work at the Site.

44. *Substantial Completion*—The time at which the Work (or a specified part thereof) has progressed to the point where, in the opinion of Engineer, the Work (or a specified part thereof) is sufficiently complete, in accordance with the Contract Documents, so that the Work (or a specified part thereof) can be utilized for the purposes for which it is intended. The terms "substantially complete" and "substantially completed" as applied to all or part of the Work refer to Substantial Completion thereof.

45. *Successful Bidder*—The Bidder submitting a responsive Bid to whom Owner makes an award.

46. *Supplementary Conditions*—That part of the Contract Documents which amends or supplements these General Conditions.

47. *Supplier*—A manufacturer, fabricator, supplier, distributor, materialman, or vendor having a direct contract with Contractor or with any Subcontractor to furnish materials or equipment to be incorporated in the Work by Contractor or Subcontractor.

48. *Underground Facilities*—All underground pipelines, conduits, ducts, cables, wires, manholes, vaults, tanks, tunnels, or other such facilities or attachments, and any encasements containing such facilities, including those that convey electricity, gases, steam, liquid petroleum products, telephone or other communications, cable television, water, wastewater, storm water, other liquids or chemicals, or traffic or other control systems.

49. *Unit Price Work*—Work to be paid for on the basis of unit prices.

50. *Work*—The entire construction or the various separately identifiable parts thereof required to be provided under the Contract Documents. Work includes and is the result of performing or providing all labor, services, and documentation necessary to produce such construction, and furnishing, installing, and incorporating all materials and equipment into such construction, all as required by the Contract Documents.

51. *Work Change Directive*—A written statement to Contractor issued on or after the Effective Date of the Agreement and signed by Owner and recommended by Engineer ordering an addition, deletion, or revision in the Work, or responding to differing or unforeseen subsurface or physical conditions under which the Work is to be performed or to emergencies. A Work Change Directive will not change the Contract Price or the Contract Times but is evidence that the parties expect that the change ordered or documented by a Work Change Directive will be incorporated in a subsequently issued Change Order following negotiations by the parties as to its effect, if any, on the Contract Price or Contract Times.

1.02 *Terminology*

A. The words and terms discussed in Paragraph 1.02.B through F are not defined but, when used in the Bidding Requirements or Contract Documents, have the indicated meaning.

B. *Intent of Certain Terms or Adjectives:*

1. The Contract Documents include the terms "as allowed," "as approved," "as ordered," "as directed" or terms of like effect or import to authorize an exercise of professional judgment by Engineer. In addition, the adjectives "reasonable," "suitable," "acceptable," "proper," "satisfactory," or adjectives of like effect or import are used to describe an action or determination of Engineer as to the Work. It is intended that such exercise of professional judgment, action, or determination will be solely to evaluate, in general, the Work for compliance with the information in the Contract Documents and with the design concept of the Project as a functioning whole as shown or indicated in the Contract Documents (unless there is a specific statement indicating otherwise). The use of any such term or adjective is not intended to and shall not be effective to assign to Engineer any duty or authority to supervise or direct the performance of the Work, or any duty or authority to undertake responsibility contrary to the provisions of Paragraph 9.09 or any other provision of the Contract Documents.

C. *Day:*

1. The word "day" means a calendar day of 24 hours measured from midnight to the next midnight.

D. *Defective:*

1. The word "defective," when modifying the word "Work," refers to Work that is unsatisfactory, faulty, or deficient in that it:

a. does not conform to the Contract Documents; or

b. does not meet the requirements of any applicable inspection, reference standard, test, or approval referred to in the Contract Documents; or

c. has been damaged prior to Engineer's recommendation of final payment (unless responsibility for the protection thereof has been assumed by Owner at Substantial Completion in accordance with Paragraph 14.04 or 14.05).

E. *Furnish, Install, Perform, Provide:*

1. The word "furnish," when used in connection with services, materials, or equipment, shall mean to supply and deliver said services, materials, or equipment to the Site (or some other specified location) ready for use or installation and in usable or operable condition.

2. The word "install," when used in connection with services, materials, or equipment, shall mean to put into use or place in final position said services, materials, or equipment complete and ready for intended use.

3. The words "perform" or "provide," when used in connection with services, materials, or equipment, shall mean to furnish and install said services, materials, or equipment complete and ready for intended use.

4. When "furnish," "install," "perform," or "provide" is not used in connection with services, materials, or equipment in a context clearly requiring an obligation of Contractor, "provide" is implied.

F. Unless stated otherwise in the Contract Documents, words or phrases that have a well-known technical or construction industry or trade meaning are used in the Contract Documents in accordance with such recognized meaning.

ARTICLE 2 – PRELIMINARY MATTERS

2.01 *Delivery of Bonds and Evidence of Insurance*

A. When Contractor delivers the executed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner such bonds as Contractor may be required to furnish.

B. *Evidence of Insurance:* Before any Work at the Site is started, Contractor and Owner shall each deliver to the other, with copies to each additional insured identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance which either of them or any additional insured may reasonably request) which Contractor and Owner respectively are required to purchase and maintain in accordance with Article 5.

2.02 *Copies of Documents*

A. Owner shall furnish to Contractor up to ten printed or hard copies of the Drawings and Project Manual. Additional copies will be furnished upon request at the cost of reproduction.

2.03 *Commencement of Contract Times; Notice to Proceed*

A. The Contract Times will commence to run on the thirtieth day after the Effective Date of the Agreement or, if a Notice to Proceed is given, on the day indicated in the Notice to Proceed. A Notice to Proceed may be given at any time within 30 days after the Effective Date of the Agreement. In no event will the Contract Times commence to run later than the sixtieth day after the day of Bid opening or the thirtieth day after the Effective Date of the Agreement, whichever date is earlier.

2.04 *Starting the Work*

A. Contractor shall start to perform the Work on the date when the Contract Times commence to run. No Work shall be done at the Site prior to the date on which the Contract Times commence to run.

2.05 *Before Starting Construction*

A. *Preliminary Schedules:* Within 10 days after the Effective Date of the Agreement (unless otherwise specified in the General Requirements), Contractor shall submit to Engineer for timely review:

1. a preliminary Progress Schedule indicating the times (numbers of days or dates) for starting and completing the various stages of the Work, including any Milestones specified in the Contract Documents;

2. a preliminary Schedule of Submittals; and

3. a preliminary Schedule of Values for all of the Work which includes quantities and prices of items which when added together equal the Contract Price and subdivides the Work into component parts in sufficient detail to serve

as the basis for progress payments during performance of the Work. Such prices will include an appropriate amount of overhead and profit applicable to each item of Work.

2.06 *Preconstruction Conference; Designation of Authorized Representatives*

A. Before any Work at the Site is started, a conference attended by Owner, Contractor, Engineer, and others as appropriate will be held to establish a working understanding among the parties as to the Work and to discuss the schedules referred to in Paragraph 2.05.A, procedures for handling Shop Drawings and other submittals, processing Applications for Payment, and maintaining required records.

B. At this conference Owner and Contractor each shall designate, in writing, a specific individual to act as its authorized representative with respect to the services and responsibilities under the Contract. Such individuals shall have the authority to transmit instructions, receive information, render decisions relative to the Contract, and otherwise act on behalf of each respective party.

2.07 *Initial Acceptance of Schedules*

A. At least 10 days before submission of the first Application for Payment a conference attended by Contractor, Engineer, and others as appropriate will be held to review for acceptability to Engineer as provided below the schedules submitted in accordance with Paragraph 2.05.A. Contractor shall have an additional 10 days to make corrections and adjustments and to complete and resubmit the schedules. No progress payment shall be made to Contractor until acceptable schedules are submitted to Engineer.

1. The Progress Schedule will be acceptable to Engineer if it provides an orderly progression of the Work to completion within the Contract Times. Such acceptance will not impose on Engineer responsibility for the Progress Schedule, for sequencing, scheduling, or progress of the Work, nor interfere with or relieve Contractor from Contractor's full responsibility therefor.

2. Contractor's Schedule of Submittals will be acceptable to Engineer if it provides a workable arrangement for reviewing and processing the required submittals.

3. Contractor's Schedule of Values will be acceptable to Engineer as to form and substance if it provides a reasonable allocation of the Contract Price to component parts of the Work.

ARTICLE 3 – CONTRACT DOCUMENTS: INTENT, AMENDING, REUSE

3.01 *Intent*

A. The Contract Documents are complementary; what is required by one is as binding as if required by all.

B. It is the intent of the Contract Documents to describe a functionally complete project (or part thereof) to be constructed in accordance with the Contract Documents. Any labor, documentation, services, materials, or equipment that reasonably may be inferred from the Contract Documents or from prevailing custom or trade usage as being required to produce the indicated result will be provided whether or not specifically called for, at no additional cost to Owner.

C. Clarifications and interpretations of the Contract Documents shall be issued by Engineer as provided in Article 9.

3.02 *Reference Standards*

A. Standards, Specifications, Codes, Laws, and Regulations

1. Reference to standards, specifications, manuals, or codes of any technical society, organization, or association, or to Laws or Regulations, whether such reference be specific or by implication, shall mean the standard, specification, manual, code, or Laws or Regulations in effect at the time of opening of Bids (or on the Effective Date of the Agreement if there were no Bids), except as may be otherwise specifically stated in the Contract Documents.

2. No provision of any such standard, specification, manual, or code, or any instruction of a Supplier, shall be effective to change the duties or responsibilities of Owner, Contractor, or Engineer, or any of their subcontractors, consultants, agents, or employees, from those set forth in the Contract Documents. No such provision or instruction shall be effective to assign to Owner, Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, any duty or authority to supervise or direct the performance of the Work or any duty or authority to undertake responsibility inconsistent with the provisions of the Contract Documents.

3.03 *Reporting and Resolving Discrepancies*

A. *Reporting Discrepancies:*

1. *Contractor's Review of Contract Documents Before Starting Work*: Before undertaking each part of the Work, Contractor shall carefully study and compare the Contract Documents and check and verify pertinent figures therein and all applicable field measurements. Contractor shall promptly report in writing to Engineer any conflict, error, ambiguity, or discrepancy which Contractor discovers, or has actual knowledge of, and shall obtain a written interpretation or clarification from Engineer before proceeding with any Work affected thereby.

2. *Contractor's Review of Contract Documents During Performance of Work*: If, during the performance of the Work, Contractor discovers any conflict, error, ambiguity, or discrepancy within the Contract Documents, or between the Contract Documents and (a) any applicable Law or Regulation , (b) any standard, specification, manual, or code, or (c) any instruction of any Supplier, then Contractor shall promptly report it to Engineer in writing. Contractor shall not proceed with the Work affected thereby (except in an emergency as required by Paragraph 6.16.A) until an amendment or supplement to the Contract Documents has been issued by one of the methods indicated in Paragraph 3.04.

3. Contractor shall not be liable to Owner or Engineer for failure to report any conflict, error, ambiguity, or discrepancy in the Contract Documents unless Contractor had actual knowledge thereof.

B. *Resolving Discrepancies:*

1. Except as may be otherwise specifically stated in the Contract Documents, the provisions of the Contract Documents shall take precedence in resolving any conflict, error, ambiguity, or discrepancy between the provisions of the Contract Documents and:

a. the provisions of any standard, specification, manual, or code, or the instruction of any Supplier (whether or not specifically incorporated by reference in the Contract Documents); or

b. the provisions of any Laws or Regulations applicable to the performance of the Work (unless such an interpretation of the provisions of the Contract Documents would result in violation of such Law or Regulation).

3.04 *Amending and Supplementing Contract Documents*

A. The Contract Documents may be amended to provide for additions, deletions, and revisions in the Work or to modify the terms and conditions thereof by either a Change Order or a Work Change Directive.

B. The requirements of the Contract Documents may be supplemented, and minor variations and deviations in the Work may be authorized, by one or more of the following ways:

1. A Field Order;

2. Engineer's approval of a Shop Drawing or Sample (subject to the provisions of Paragraph 6.17.D.3); or

3. Engineer's written interpretation or clarification.

3.05 *Reuse of Documents*

A. Contractor and any Subcontractor or Supplier shall not:

1. have or acquire any title to or ownership rights in any of the Drawings, Specifications, or other documents (or copies of any thereof) prepared by or bearing the seal of Engineer or its consultants, including electronic media editions; or

2. reuse any such Drawings, Specifications, other documents, or copies thereof on extensions of the Project or any other project without written consent of Owner and Engineer and specific written verification or adaptation by Engineer.

B. The prohibitions of this Paragraph 3.05 will survive final payment, or termination of the Contract. Nothing herein shall preclude Contractor from retaining copies of the Contract Documents for record purposes.

3.06 *Electronic Data*

A. Unless otherwise stated in the Supplementary Conditions, the data furnished by Owner or Engineer to Contractor, or by Contractor to Owner or Engineer, that may be relied upon are limited to the printed copies (also known as hard copies). Files in electronic media format of text, data, graphics, or other types are furnished only for the convenience of the receiving party. Any conclusion or information obtained or derived from such electronic files will be at the user's sole risk. If there is a discrepancy between the electronic files and the hard copies, the hard copies govern.

B. Because data stored in electronic media format can deteriorate or be modified inadvertently or otherwise without authorization of the data's creator, the party receiving electronic files agrees that it will perform acceptance tests or procedures within 60 days, after which the receiving party shall be deemed to have accepted the data thus transferred. Any errors detected within the 60-day acceptance period will be corrected by the transferring party.

C. When transferring documents in electronic media format, the transferring party makes no representations as to long term compatibility, usability, or readability of documents resulting from the use of software application packages, operating systems, or computer hardware differing from those used by the data's creator.

ARTICLE 4 – AVAILABILITY OF LANDS; SUBSURFACE AND PHYSICAL CONDITIONS; HAZARDOUS ENVIRONMENTAL CONDITIONS; REFERENCE POINTS

4.01 *Availability of Lands*

A. Owner shall furnish the Site. Owner shall notify Contractor of any encumbrances or restrictions not of general application but specifically related to use of the Site with which Contractor must comply in performing the Work. Owner will obtain in a timely manner and pay for easements for permanent structures or permanent changes in existing facilities. If Contractor and Owner are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times, or both, as a result of any delay in Owner's furnishing the Site or a part thereof, Contractor may make a Claim therefor as provided in Paragraph 10.05.

B. Upon reasonable written request, Owner shall furnish Contractor with a current statement of record legal title and legal description of the lands upon which the Work is to be performed and Owner's interest therein as necessary for giving notice of or filing a mechanic's or construction lien against such lands in accordance with applicable Laws and Regulations.

C. Contractor shall provide for all additional lands and access thereto that may be required for temporary construction facilities or storage of materials and equipment.

4.02 *Subsurface and Physical Conditions*

A. *Reports and Drawings:* The Supplementary Conditions identify:

1. those reports known to Owner of explorations and tests of subsurface conditions at or contiguous to the Site; and

2. those drawings known to Owner of physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities).

B. *Limited Reliance by Contractor on Technical Data Authorized:* Contractor may rely upon the accuracy of the "technical data" contained in such reports and drawings, but such reports and drawings are not Contract Documents. Such "technical data" is identified in the Supplementary Conditions. Except for such reliance on such "technical data," Contractor may not rely upon or make any claim against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors with respect to:

1. the completeness of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences, and procedures of construction to be employed by Contractor, and safety precautions and programs incident thereto; or

2. other data, interpretations, opinions, and information contained in such reports or shown or indicated in such drawings; or

3. any Contractor interpretation of or conclusion drawn from any "technical data" or any such other data, interpretations, opinions, or information.

4.03 *Differing Subsurface or Physical Conditions*

A. *Notice:* If Contractor believes that any subsurface or physical condition that is uncovered or revealed either:

1. is of such a nature as to establish that any "technical data" on which Contractor is entitled to rely as provided in Paragraph 4.02 is materially inaccurate; or

2. is of such a nature as to require a change in the Contract Documents; or

3. differs materially from that shown or indicated in the Contract Documents; or

4. is of an unusual nature, and differs materially from conditions ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract Documents;

then Contractor shall, promptly after becoming aware thereof and before further disturbing the subsurface or physical conditions or performing any Work in connection therewith (except in an emergency as required by Paragraph 6.16.A), notify Owner and Engineer in writing about such condition. Contractor shall not further disturb such condition or perform any Work in connection therewith (except as aforesaid) until receipt of written order to do so.

B. *Engineer's Review*: After receipt of written notice as required by Paragraph 4.03.A, Engineer will promptly review the pertinent condition, determine the necessity of Owner's obtaining additional exploration or tests with respect thereto, and advise Owner in writing (with a copy to Contractor) of Engineer's findings and conclusions.

C. *Possible Price and Times Adjustments:*

1. The Contract Price or the Contract Times, or both, will be equitably adjusted to the extent that the existence of such differing subsurface or physical condition causes an increase or decrease in Contractor's cost of, or time required for, performance of the Work; subject, however, to the following:

a. such condition must meet any one or more of the categories described in Paragraph 4.03.A; and

b. with respect to Work that is paid for on a unit price basis, any adjustment in Contract Price will be subject to the provisions of Paragraphs 9.07 and 11.03.

2. Contractor shall not be entitled to any adjustment in the Contract Price or Contract Times if:

    a. Contractor knew of the existence of such conditions at the time Contractor made a final commitment to Owner with respect to Contract Price and Contract Times by the submission of a Bid or becoming bound under a negotiated contract; or

    b. the existence of such condition could reasonably have been discovered or revealed as a result of any examination, investigation, exploration, test, or study of the Site and contiguous areas required by the Bidding Requirements or Contract Documents to be conducted by or for Contractor prior to Contractor's making such final commitment; or

    c. Contractor failed to give the written notice as required by Paragraph 4.03.A.

3. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times, or both, a Claim may be made therefor as provided in Paragraph 10.05. However, neither Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors shall be liable to Contractor for any claims, costs, losses, or damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by Contractor on or in connection with any other project or anticipated project.

4.04 *Underground Facilities*

A. *Shown or Indicated:* The information and data shown or indicated in the Contract Documents with respect to existing Underground Facilities at or contiguous to the Site is based on information and data furnished to Owner or Engineer by the owners of such Underground Facilities, including Owner, or by others. Unless it is otherwise expressly provided in the Supplementary Conditions:

    1. Owner and Engineer shall not be responsible for the accuracy or completeness of any such information or data provided by others; and

    2. the cost of all of the following will be included in the Contract Price, and Contractor shall have full responsibility for:

        a. reviewing and checking all such information and data;

        b. locating all Underground Facilities shown or indicated in the Contract Documents;

        c. coordination of the Work with the owners of such Underground Facilities, including Owner, during construction; and

        d. the safety and protection of all such Underground Facilities and repairing any damage thereto resulting from the Work.

B. *Not Shown or Indicated:*

    1. If an Underground Facility is uncovered or revealed at or contiguous to the Site which was not shown or indicated, or not shown or indicated with reasonable accuracy in the Contract Documents, Contractor shall, promptly after becoming aware thereof and before further disturbing conditions affected thereby or performing any Work in connection therewith (except in an emergency as required by Paragraph 6.16.A), identify the owner of such Underground Facility and give written notice to that owner and to Owner and Engineer. Engineer will promptly review the Underground Facility and determine the extent, if any, to which a change is required in the Contract Documents to reflect and document the consequences of the existence or location of the Underground Facility. During such time, Contractor shall be responsible for the safety and protection of such Underground Facility.

2. If Engineer concludes that a change in the Contract Documents is required, a Work Change Directive or a Change Order will be issued to reflect and document such consequences. An equitable adjustment shall be made in the Contract Price or Contract Times, or both, to the extent that they are attributable to the existence or location of any Underground Facility that was not shown or indicated or not shown or indicated with reasonable accuracy in the Contract Documents and that Contractor did not know of and could not reasonably have been expected to be aware of or to have anticipated. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any such adjustment in Contract Price or Contract Times, Owner or Contractor may make a Claim therefor as provided in Paragraph 10.05.

4.05 *Reference Points*

A. Owner shall provide engineering surveys to establish reference points for construction which in Engineer's judgment are necessary to enable Contractor to proceed with the Work. Contractor shall be responsible for laying out the Work, shall protect and preserve the established reference points and property monuments, and shall make no changes or relocations without the prior written approval of Owner. Contractor shall report to Engineer whenever any reference point or property monument is lost or destroyed or requires relocation because of necessary changes in grades or locations, and shall be responsible for the accurate replacement or relocation of such reference points or property monuments by professionally qualified personnel.

4.06 *Hazardous Environmental Condition at Site*

A. *Reports and Drawings:* The Supplementary Conditions identify those reports and drawings known to Owner relating to Hazardous Environmental Conditions that have been identified at the Site.

B. *Limited Reliance by Contractor on Technical Data Authorized:* Contractor may rely upon the accuracy of the "technical data" contained in such reports and drawings, but such reports and drawings are not Contract Documents. Such "technical data" is identified in the Supplementary Conditions. Except for such reliance on such "technical data," Contractor may not rely upon or make any claim against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors with respect to:

1. the completeness of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences and procedures of construction to be employed by Contractor and safety precautions and programs incident thereto; or

2. other data, interpretations, opinions and information contained in such reports or shown or indicated in such drawings; or

3. any Contractor interpretation of or conclusion drawn from any "technical data" or any such other data, interpretations, opinions or information.

C. Contractor shall not be responsible for any Hazardous Environmental Condition uncovered or revealed at the Site which was not shown or indicated in Drawings or Specifications or identified in the Contract Documents to be within the scope of the Work. Contractor shall be responsible for a Hazardous Environmental Condition created with any materials brought to the Site by Contractor, Subcontractors, Suppliers, or anyone else for whom Contractor is responsible.

D. If Contractor encounters a Hazardous Environmental Condition or if Contractor or anyone for whom Contractor is responsible creates a Hazardous Environmental Condition, Contractor shall immediately: (i) secure or otherwise isolate such condition; (ii) stop all Work in connection with such condition and in any area affected thereby (except in an emergency as required by Paragraph 6.16.A); and (iii) notify Owner and Engineer (and promptly thereafter confirm such notice in writing). Owner shall promptly consult with Engineer concerning the necessity for Owner to retain a qualified expert to evaluate such condition or take corrective action, if any. Promptly after consulting with Engineer, Owner shall take such actions as are necessary to permit Owner to timely obtain required permits and provide Contractor the written notice required by Paragraph 4.06.E.

E. Contractor shall not be required to resume Work in connection with such condition or in any affected area until after Owner has obtained any required permits related thereto and delivered written notice to Contractor: (i) specifying that such condition and any affected area is or has been rendered safe for the resumption of Work; or (ii) specifying any special conditions under which such Work may be resumed safely. If Owner and Contractor cannot agree as to entitlement to or on the amount or extent, if any, of any adjustment in Contract Price or Contract Times, or both, as a result of such Work stoppage or such special conditions under which Work is agreed to be resumed by Contractor, either party may make a Claim therefor as provided in Paragraph 10.05.

F. If after receipt of such written notice Contractor does not agree to resume such Work based on a reasonable belief it is unsafe, or does not agree to resume such Work under such special conditions, then Owner may order the portion of the Work that is in the area affected by such condition to be deleted from the Work. If Owner and Contractor cannot agree as to entitlement to or on the amount or extent, if any, of an adjustment in Contract Price or Contract Times as a result of deleting such portion of the Work, then either party may make a Claim therefor as provided in Paragraph 10.05. Owner may have such deleted portion of the Work performed by Owner's own forces or others in accordance with Article 7.

G. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, Subcontractors, and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to a Hazardous Environmental Condition, provided that such Hazardous Environmental Condition: (i) was not shown or indicated in the Drawings or Specifications or identified in the Contract Documents to be included within the scope of the Work, and (ii) was not created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 4.06.G shall obligate Owner to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.

H. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to a Hazardous Environmental Condition created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 4.06.H shall obligate Contractor to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.

I. The provisions of Paragraphs 4.02, 4.03, and 4.04 do not apply to a Hazardous Environmental Condition uncovered or revealed at the Site.

ARTICLE 5 – BONDS AND INSURANCE

5.01 *Performance, Payment, and Other Bonds*

A. Contractor shall furnish performance and payment bonds, each in an amount at least equal to the Contract Price as security for the faithful performance and payment of all of Contractor's obligations under the Contract Documents. These bonds shall remain in effect until one year after the date when final payment becomes due or until completion of the correction period specified in Paragraph 13.07, whichever is later, except as provided otherwise by Laws or Regulations or by the Contract Documents. Contractor shall also furnish such other bonds as are required by the Contract Documents.

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

C. If the surety on any bond furnished by Contractor is declared bankrupt or becomes insolvent or its right to do business is terminated in any state where any part of the Project is located or it ceases to meet the requirements of Paragraph 5.01.B, Contractor shall promptly notify Owner and Engineer and shall, within 20 days after the event giving rise to such notification, provide another bond and surety, both of which shall comply with the requirements of Paragraphs 5.01.B and 5.02.

5.02 *Licensed Sureties and Insurers*

A. All bonds and insurance required by the Contract Documents to be purchased and maintained by Owner or Contractor shall be obtained from surety or insurance companies that are duly licensed or authorized in the jurisdiction in which the Project is located to issue bonds or insurance policies for the limits and coverages so required. Such surety and insurance companies shall also meet such additional requirements and qualifications as may be provided in the Supplementary Conditions.

5.03 *Certificates of Insurance*

A. Contractor shall deliver to Owner, with copies to each additional insured and loss payee identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance requested by Owner or any other additional insured) which Contractor is required to purchase and maintain.

B. Owner shall deliver to Contractor, with copies to each additional insured and loss payee identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance requested by Contractor or any other additional insured) which Owner is required to purchase and maintain.

C. Failure of Owner to demand such certificates or other evidence of Contractor's full compliance with these insurance requirements or failure of Owner to identify a deficiency in compliance from the evidence provided shall not be construed as a waiver of Contractor's obligation to maintain such insurance.

D. Owner does not represent that insurance coverage and limits established in this Contract necessarily will be adequate to protect Contractor.

E. The insurance and insurance limits required herein shall not be deemed as a limitation on Contractor's liability under the indemnities granted to Owner in the Contract Documents.

5.04 *Contractor's Insurance*

A. Contractor shall purchase and maintain such insurance as is appropriate for the Work being performed and as will provide protection from claims set forth below which may arise out of or result from Contractor's performance of the Work and Contractor's other obligations under the Contract Documents, whether it is to be performed by Contractor, any Subcontractor or Supplier, or by anyone directly or indirectly employed by any of them to perform any of the Work, or by anyone for whose acts any of them may be liable:

1. claims under workers' compensation, disability benefits, and other similar employee benefit acts;

2. claims for damages because of bodily injury, occupational sickness or disease, or death of Contractor's employees;

3. claims for damages because of bodily injury, sickness or disease, or death of any person other than Contractor's employees;

4. claims for damages insured by reasonably available personal injury liability coverage which are sustained:

    a. by any person as a result of an offense directly or indirectly related to the employment of such person by Contractor, or

b. by any other person for any other reason;

5. claims for damages, other than to the Work itself, because of injury to or destruction of tangible property wherever located, including loss of use resulting therefrom; and

6. claims for damages because of bodily injury or death of any person or property damage arising out of the ownership, maintenance or use of any motor vehicle.

B. The policies of insurance required by this Paragraph 5.04 shall:

1. with respect to insurance required by Paragraphs 5.04.A.3 through 5.04.A.6 inclusive, be written on an occurrence basis, include as additional insureds (subject to any customary exclusion regarding professional liability) Owner and Engineer, and any other individuals or entities identified in the Supplementary Conditions, all of whom shall be listed as additional insureds, and include coverage for the respective officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of all such additional insureds, and the insurance afforded to these additional insureds shall provide primary coverage for all claims covered thereby;

2. include at least the specific coverages and be written for not less than the limits of liability provided in the Supplementary Conditions or required by Laws or Regulations, whichever is greater;

3. include contractual liability insurance covering Contractor's indemnity obligations under Paragraphs 6.11 and 6.20;

4. contain a provision or endorsement that the coverage afforded will not be canceled, materially changed or renewal refused until at least 30 days prior written notice has been given to Owner and Contractor and to each other additional insured identified in the Supplementary Conditions to whom a certificate of insurance has been issued (and the certificates of insurance furnished by the Contractor pursuant to Paragraph 5.03 will so provide);

5. remain in effect at least until final payment and at all times thereafter when Contractor may be correcting, removing, or replacing defective Work in accordance with Paragraph 13.07; and

6. include completed operations coverage:

a. Such insurance shall remain in effect for two years after final payment.

b. Contractor shall furnish Owner and each other additional insured identified in the Supplementary Conditions, to whom a certificate of insurance has been issued, evidence satisfactory to Owner and any such additional insured of continuation of such insurance at final payment and one year thereafter.

5.05 *Owner's Liability Insurance*

A. In addition to the insurance required to be provided by Contractor under Paragraph 5.04, Owner, at Owner's option, may purchase and maintain at Owner's expense Owner's own liability insurance as will protect Owner against claims which may arise from operations under the Contract Documents.

5.06 *Property Insurance*

A. Unless otherwise provided in the Supplementary Conditions, Owner shall purchase and maintain property insurance upon the Work at the Site in the amount of the full replacement cost thereof (subject to such deductible amounts as may be provided in the Supplementary Conditions or required by Laws and Regulations). This insurance shall:

1. include the interests of Owner, Contractor, Subcontractors, and Engineer, and any other individuals or entities identified in the Supplementary Conditions, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, each of whom is deemed to have an insurable interest and shall be listed as a loss payee;

2. be written on a Builder's Risk "all-risk" policy form that shall at least include insurance for physical loss or damage to the Work, temporary buildings, falsework, and materials and equipment in transit, and shall insure against at least the following perils or causes of loss: fire, lightning, extended coverage, theft, vandalism and malicious mischief, earthquake, collapse, debris removal, demolition occasioned by enforcement of Laws and Regulations, water damage (other than that caused by flood), and such other perils or causes of loss as may be specifically required by the Supplementary Conditions.

3. include expenses incurred in the repair or replacement of any insured property (including but not limited to fees and charges of engineers and architects);

4. cover materials and equipment stored at the Site or at another location that was agreed to in writing by Owner prior to being incorporated in the Work, provided that such materials and equipment have been included in an Application for Payment recommended by Engineer;

5. allow for partial utilization of the Work by Owner;

6. include testing and startup; and

7. be maintained in effect until final payment is made unless otherwise agreed to in writing by Owner, Contractor, and Engineer with 30 days written notice to each other loss payee to whom a certificate of insurance has been issued.

B. Owner shall purchase and maintain such equipment breakdown insurance or additional property insurance as may be required by the Supplementary Conditions or Laws and Regulations which will include the interests of Owner, Contractor, Subcontractors, and Engineer, and any other individuals or entities identified in the Supplementary Conditions, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them, each of whom is deemed to have an insurable interest and shall be listed as a loss payee.

C. All the policies of insurance (and the certificates or other evidence thereof) required to be purchased and maintained in accordance with this Paragraph 5.06 will contain a provision or endorsement that the coverage afforded will not be canceled or materially changed or renewal refused until at least 30 days prior written notice has been given to Owner and Contractor and to each other loss payee to whom a certificate of insurance has been issued and will contain waiver provisions in accordance with Paragraph 5.07.

D. Owner shall not be responsible for purchasing and maintaining any property insurance specified in this Paragraph 5.06 to protect the interests of Contractor, Subcontractors, or others in the Work to the extent of any deductible amounts that are identified in the Supplementary Conditions. The risk of loss within such identified deductible amount will be borne by Contractor, Subcontractors, or others suffering any such loss, and if any of them wishes property insurance coverage within the limits of such amounts, each may purchase and maintain it at the purchaser's own expense.

E. If Contractor requests in writing that other special insurance be included in the property insurance policies provided under this Paragraph 5.06, Owner shall, if possible, include such insurance, and the cost thereof will be charged to Contractor by appropriate Change Order. Prior to commencement of the Work at the Site, Owner shall in writing advise Contractor whether or not such other insurance has been procured by Owner.

5.07 *Waiver of Rights*

A. Owner and Contractor intend that all policies purchased in accordance with Paragraph 5.06 will protect Owner, Contractor, Subcontractors, and Engineer, and all other individuals or entities identified in the Supplementary Conditions as loss payees (and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them) in such policies and will provide primary coverage for all losses and damages caused by the perils or causes of loss covered thereby. All such policies shall contain provisions to the effect that in the event of payment of any loss or damage the insurers will have no rights of recovery against any of the insureds or loss payees thereunder. Owner and Contractor waive all rights against each other and their respective officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them for all losses and damages caused by, arising out of or resulting from any of the perils or causes of loss covered by such policies

and any other property insurance applicable to the Work; and, in addition, waive all such rights against Subcontractors and Engineer, and all other individuals or entities identified in the Supplementary Conditions as loss payees (and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them) under such policies for losses and damages so caused. None of the above waivers shall extend to the rights that any party making such waiver may have to the proceeds of insurance held by Owner as trustee or otherwise payable under any policy so issued.

B. Owner waives all rights against Contractor, Subcontractors, and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them for:

1. loss due to business interruption, loss of use, or other consequential loss extending beyond direct physical loss or damage to Owner's property or the Work caused by, arising out of, or resulting from fire or other perils whether or not insured by Owner; and

2. loss or damage to the completed Project or part thereof caused by, arising out of, or resulting from fire or other insured peril or cause of loss covered by any property insurance maintained on the completed Project or part thereof by Owner during partial utilization pursuant to Paragraph 14.05, after Substantial Completion pursuant to Paragraph 14.04, or after final payment pursuant to Paragraph 14.07.

C. Any insurance policy maintained by Owner covering any loss, damage or consequential loss referred to in Paragraph 5.07.B shall contain provisions to the effect that in the event of payment of any such loss, damage, or consequential loss, the insurers will have no rights of recovery against Contractor, Subcontractors, or Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them.

5.08 *Receipt and Application of Insurance Proceeds*

A. Any insured loss under the policies of insurance required by Paragraph 5.06 will be adjusted with Owner and made payable to Owner as fiduciary for the loss payees, as their interests may appear, subject to the requirements of any applicable mortgage clause and of Paragraph 5.08.B. Owner shall deposit in a separate account any money so received and shall distribute it in accordance with such agreement as the parties in interest may reach. If no other special agreement is reached, the damaged Work shall be repaired or replaced, the moneys so received applied on account thereof, and the Work and the cost thereof covered by an appropriate Change Order.

B. Owner as fiduciary shall have power to adjust and settle any loss with the insurers unless one of the parties in interest shall object in writing within 15 days after the occurrence of loss to Owner's exercise of this power. If such objection be made, Owner as fiduciary shall make settlement with the insurers in accordance with such agreement as the parties in interest may reach. If no such agreement among the parties in interest is reached, Owner as fiduciary shall adjust and settle the loss with the insurers and, if required in writing by any party in interest, Owner as fiduciary shall give bond for the proper performance of such duties.

5.09 *Acceptance of Bonds and Insurance; Option to Replace*

A. If either Owner or Contractor has any objection to the coverage afforded by or other provisions of the bonds or insurance required to be purchased and maintained by the other party in accordance with Article 5 on the basis of non-conformance with the Contract Documents, the objecting party shall so notify the other party in writing within 10 days after receipt of the certificates (or other evidence requested) required by Paragraph 2.01.B. Owner and Contractor shall each provide to the other such additional information in respect of insurance provided as the other may reasonably request. If either party does not purchase or maintain all of the bonds and insurance required of such party by the Contract Documents, such party shall notify the other party in writing of such failure to purchase prior to the start of the Work, or of such failure to maintain prior to any change in the required coverage. Without prejudice to any other right or remedy, the other party may elect to obtain equivalent bonds or insurance to protect such other party's interests at the expense of the party who was required to provide such coverage, and a Change Order shall be issued to adjust the Contract Price accordingly.

5.10 *Partial Utilization, Acknowledgment of Property Insurer*

A. If Owner finds it necessary to occupy or use a portion or portions of the Work prior to Substantial Completion of all the Work as provided in Paragraph 14.05, no such use or occupancy shall commence before the insurers providing the property insurance pursuant to Paragraph 5.06 have acknowledged notice thereof and in writing effected any changes in coverage necessitated thereby. The insurers providing the property insurance shall consent by endorsement on the policy or policies, but the property insurance shall not be canceled or permitted to lapse on account of any such partial use or occupancy.

ARTICLE 6 – CONTRACTOR'S RESPONSIBILITIES

6.01 *Supervision and Superintendence*

A. Contractor shall supervise, inspect, and direct the Work competently and efficiently, devoting such attention thereto and applying such skills and expertise as may be necessary to perform the Work in accordance with the Contract Documents. Contractor shall be solely responsible for the means, methods, techniques, sequences, and procedures of construction. Contractor shall not be responsible for the negligence of Owner or Engineer in the design or specification of a specific means, method, technique, sequence, or procedure of construction which is shown or indicated in and expressly required by the Contract Documents.

B. At all times during the progress of the Work, Contractor shall assign a competent resident superintendent who shall not be replaced without written notice to Owner and Engineer except under extraordinary circumstances.

6.02 *Labor; Working Hours*

A. Contractor shall provide competent, suitably qualified personnel to survey and lay out the Work and perform construction as required by the Contract Documents. Contractor shall at all times maintain good discipline and order at the Site.

B. Except as otherwise required for the safety or protection of persons or the Work or property at the Site or adjacent thereto, and except as otherwise stated in the Contract Documents, all Work at the Site shall be performed during regular working hours. Contractor will not permit the performance of Work on a Saturday, Sunday, or any legal holiday without Owner's written consent (which will not be unreasonably withheld) given after prior written notice to Engineer.

6.03 *Services, Materials, and Equipment*

A. Unless otherwise specified in the Contract Documents, Contractor shall provide and assume full responsibility for all services, materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water, sanitary facilities, temporary facilities, and all other facilities and incidentals necessary for the performance, testing, start-up, and completion of the Work.

B. All materials and equipment incorporated into the Work shall be as specified or, if not specified, shall be of good quality and new, except as otherwise provided in the Contract Documents. All special warranties and guarantees required by the Specifications shall expressly run to the benefit of Owner. If required by Engineer, Contractor shall furnish satisfactory evidence (including reports of required tests) as to the source, kind, and quality of materials and equipment.

C. All materials and equipment shall be stored, applied, installed, connected, erected, protected, used, cleaned, and conditioned in accordance with instructions of the applicable Supplier, except as otherwise may be provided in the Contract Documents.

6.04 *Progress Schedule*

A. Contractor shall adhere to the Progress Schedule established in accordance with Paragraph 2.07 as it may be adjusted from time to time as provided below.

1. Contractor shall submit to Engineer for acceptance (to the extent indicated in Paragraph 2.07) proposed adjustments in the Progress Schedule that will not result in changing the Contract Times. Such adjustments will comply with any provisions of the General Requirements applicable thereto.

2. Proposed adjustments in the Progress Schedule that will change the Contract Times shall be submitted in accordance with the requirements of Article 12. Adjustments in Contract Times may only be made by a Change Order.

6.05 *Substitutes and "Or-Equals"*

A. Whenever an item of material or equipment is specified or described in the Contract Documents by using the name of a proprietary item or the name of a particular Supplier, the specification or description is intended to establish the type, function, appearance, and quality required. Unless the specification or description contains or is followed by words reading that no like, equivalent, or "or-equal" item or no substitution is permitted, other items of material or equipment or material or equipment of other Suppliers may be submitted to Engineer for review under the circumstances described below.

1. *"Or-Equal" Items:* If in Engineer's sole discretion an item of material or equipment proposed by Contractor is functionally equal to that named and sufficiently similar so that no change in related Work will be required, it may be considered by Engineer as an "or-equal" item, in which case review and approval of the proposed item may, in Engineer's sole discretion, be accomplished without compliance with some or all of the requirements for approval of proposed substitute items. For the purposes of this Paragraph 6.05.A.1, a proposed item of material or equipment will be considered functionally equal to an item so named if:

a. in the exercise of reasonable judgment Engineer determines that:

1) it is at least equal in materials of construction, quality, durability, appearance, strength, and design characteristics;

2) it will reliably perform at least equally well the function and achieve the results imposed by the design concept of the completed Project as a functioning whole; and

3) it has a proven record of performance and availability of responsive service.

b. Contractor certifies that, if approved and incorporated into the Work:

1) there will be no increase in cost to the Owner or increase in Contract Times; and

2) it will conform substantially to the detailed requirements of the item named in the Contract Documents.

2. *Substitute Items:*

a. If in Engineer's sole discretion an item of material or equipment proposed by Contractor does not qualify as an "or-equal" item under Paragraph 6.05.A.1, it will be considered a proposed substitute item.

b. Contractor shall submit sufficient information as provided below to allow Engineer to determine if the item of material or equipment proposed is essentially equivalent to that named and an acceptable substitute therefor. Requests for review of proposed substitute items of material or equipment will not be accepted by Engineer from anyone other than Contractor.

c. The requirements for review by Engineer will be as set forth in Paragraph 6.05.A.2.d, as supplemented by the General Requirements, and as Engineer may decide is appropriate under the circumstances.

d. Contractor shall make written application to Engineer for review of a proposed substitute item of material or equipment that Contractor seeks to furnish or use. The application:

1) shall certify that the proposed substitute item will:

a) perform adequately the functions and achieve the results called for by the general design,

b) be similar in substance to that specified, and

c) be suited to the same use as that specified;

2) will state:

a) the extent, if any, to which the use of the proposed substitute item will prejudice Contractor's achievement of Substantial Completion on time,

b) whether use of the proposed substitute item in the Work will require a change in any of the Contract Documents (or in the provisions of any other direct contract with Owner for other work on the Project) to adapt the design to the proposed substitute item, and

c) whether incorporation or use of the proposed substitute item in connection with the Work is subject to payment of any license fee or royalty;

3) will identify:

a) all variations of the proposed substitute item from that specified, and

b) available engineering, sales, maintenance, repair, and replacement services; and

4) shall contain an itemized estimate of all costs or credits that will result directly or indirectly from use of such substitute item, including costs of redesign and claims of other contractors affected by any resulting change.

B. *Substitute Construction Methods or Procedures:* If a specific means, method, technique, sequence, or procedure of construction is expressly required by the Contract Documents, Contractor may furnish or utilize a substitute means, method, technique, sequence, or procedure of construction approved by Engineer. Contractor shall submit sufficient information to allow Engineer, in Engineer's sole discretion, to determine that the substitute proposed is equivalent to that expressly called for by the Contract Documents. The requirements for review by Engineer will be similar to those provided in Paragraph 6.05.A.2.

C. *Engineer's Evaluation:* Engineer will be allowed a reasonable time within which to evaluate each proposal or submittal made pursuant to Paragraphs 6.05.A and 6.05.B. Engineer may require Contractor to furnish additional data about the proposed substitute item. Engineer will be the sole judge of acceptability. No "or equal" or substitute will be ordered, installed or utilized until Engineer's review is complete, which will be evidenced by a Change Order in the case of a substitute and an approved Shop Drawing for an "or equal." Engineer will advise Contractor in writing of any negative determination.

D. *Special Guarantee:* Owner may require Contractor to furnish at Contractor's expense a special performance guarantee or other surety with respect to any substitute.

E. *Engineer's Cost Reimbursement*: Engineer will record Engineer's costs in evaluating a substitute proposed or submitted by Contractor pursuant to Paragraphs 6.05.A.2 and 6.05.B. Whether or not Engineer approves a substitute so proposed or submitted by Contractor, Contractor shall reimburse Owner for the reasonable charges of Engineer for

evaluating each such proposed substitute. Contractor shall also reimburse Owner for the reasonable charges of Engineer for making changes in the Contract Documents (or in the provisions of any other direct contract with Owner) resulting from the acceptance of each proposed substitute.

F. *Contractor's Expense*: Contractor shall provide all data in support of any proposed substitute or "or-equal" at Contractor's expense.

6.06 *Concerning Subcontractors, Suppliers, and Others*

A. Contractor shall not employ any Subcontractor, Supplier, or other individual or entity (including those acceptable to Owner as indicated in Paragraph 6.06.B), whether initially or as a replacement, against whom Owner may have reasonable objection. Contractor shall not be required to employ any Subcontractor, Supplier, or other individual or entity to furnish or perform any of the Work against whom Contractor has reasonable objection.

B. If the Supplementary Conditions require the identity of certain Subcontractors, Suppliers, or other individuals or entities to be submitted to Owner in advance for acceptance by Owner by a specified date prior to the Effective Date of the Agreement, and if Contractor has submitted a list thereof in accordance with the Supplementary Conditions, Owner's acceptance (either in writing or by failing to make written objection thereto by the date indicated for acceptance or objection in the Bidding Documents or the Contract Documents) of any such Subcontractor, Supplier, or other individual or entity so identified may be revoked on the basis of reasonable objection after due investigation. Contractor shall submit an acceptable replacement for the rejected Subcontractor, Supplier, or other individual or entity, and the Contract Price will be adjusted by the difference in the cost occasioned by such replacement, and an appropriate Change Order will be issued. No acceptance by Owner of any such Subcontractor, Supplier, or other individual or entity, whether initially or as a replacement, shall constitute a waiver of any right of Owner or Engineer to reject defective Work.

C. Contractor shall be fully responsible to Owner and Engineer for all acts and omissions of the Subcontractors, Suppliers, and other individuals or entities performing or furnishing any of the Work just as Contractor is responsible for Contractor's own acts and omissions. Nothing in the Contract Documents:

1. shall create for the benefit of any such Subcontractor, Supplier, or other individual or entity any contractual relationship between Owner or Engineer and any such Subcontractor, Supplier or other individual or entity; nor

2. shall create any obligation on the part of Owner or Engineer to pay or to see to the payment of any moneys due any such Subcontractor, Supplier, or other individual or entity except as may otherwise be required by Laws and Regulations.

D. Contractor shall be solely responsible for scheduling and coordinating the Work of Subcontractors, Suppliers, and other individuals or entities performing or furnishing any of the Work under a direct or indirect contract with Contractor.

E. Contractor shall require all Subcontractors, Suppliers, and such other individuals or entities performing or furnishing any of the Work to communicate with Engineer through Contractor.

F. The divisions and sections of the Specifications and the identifications of any Drawings shall not control Contractor in dividing the Work among Subcontractors or Suppliers or delineating the Work to be performed by any specific trade.

G. All Work performed for Contractor by a Subcontractor or Supplier will be pursuant to an appropriate agreement between Contractor and the Subcontractor or Supplier which specifically binds the Subcontractor or Supplier to the applicable terms and conditions of the Contract Documents for the benefit of Owner and Engineer. Whenever any such agreement is with a Subcontractor or Supplier who is listed as a loss payee on the property insurance provided in Paragraph 5.06, the agreement between the Contractor and the Subcontractor or Supplier will contain provisions whereby the Subcontractor or Supplier waives all rights against Owner, Contractor, Engineer, and all other individuals or entities identified in the Supplementary Conditions to be listed as insureds or loss payees (and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them) for all losses and

damages caused by, arising out of, relating to, or resulting from any of the perils or causes of loss covered by such policies and any other property insurance applicable to the Work. If the insurers on any such policies require separate waiver forms to be signed by any Subcontractor or Supplier, Contractor will obtain the same.

6.07 *Patent Fees and Royalties*

A. Contractor shall pay all license fees and royalties and assume all costs incident to the use in the performance of the Work or the incorporation in the Work of any invention, design, process, product, or device which is the subject of patent rights or copyrights held by others. If a particular invention, design, process, product, or device is specified in the Contract Documents for use in the performance of the Work and if, to the actual knowledge of Owner or Engineer, its use is subject to patent rights or copyrights calling for the payment of any license fee or royalty to others, the existence of such rights shall be disclosed by Owner in the Contract Documents.

B. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, and its officers, directors, members, partners, employees, agents, consultants, and subcontractors from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals, and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device specified in the Contract Documents, but not identified as being subject to payment of any license fee or royalty to others required by patent rights or copyrights.

C. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device not specified in the Contract Documents.

6.08 *Permits*

A. Unless otherwise provided in the Supplementary Conditions, Contractor shall obtain and pay for all construction permits and licenses. Owner shall assist Contractor, when necessary, in obtaining such permits and licenses. Contractor shall pay all governmental charges and inspection fees necessary for the prosecution of the Work which are applicable at the time of opening of Bids, or, if there are no Bids, on the Effective Date of the Agreement. Owner shall pay all charges of utility owners for connections for providing permanent service to the Work.

6.09 *Laws and Regulations*

A. Contractor shall give all notices required by and shall comply with all Laws and Regulations applicable to the performance of the Work. Except where otherwise expressly required by applicable Laws and Regulations, neither Owner nor Engineer shall be responsible for monitoring Contractor's compliance with any Laws or Regulations.

B. If Contractor performs any Work knowing or having reason to know that it is contrary to Laws or Regulations, Contractor shall bear all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such Work. However, it shall not be Contractor's responsibility to make certain that the Specifications and Drawings are in accordance with Laws and Regulations, but this shall not relieve Contractor of Contractor's obligations under Paragraph 3.03.

C. Changes in Laws or Regulations not known at the time of opening of Bids (or, on the Effective Date of the Agreement if there were no Bids) having an effect on the cost or time of performance of the Work shall be the subject of an adjustment in Contract Price or Contract Times. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any such adjustment, a Claim may be made therefor as provided in Paragraph 10.05.

6.10 *Taxes*

A. Contractor shall pay all sales, consumer, use, and other similar taxes required to be paid by Contractor in accordance with the Laws and Regulations of the place of the Project which are applicable during the performance of the Work.

6.11 *Use of Site and Other Areas*

A. *Limitation on Use of Site and Other Areas:*

1. Contractor shall confine construction equipment, the storage of materials and equipment, and the operations of workers to the Site and other areas permitted by Laws and Regulations, and shall not unreasonably encumber the Site and other areas with construction equipment or other materials or equipment. Contractor shall assume full responsibility for any damage to any such land or area, or to the owner or occupant thereof, or of any adjacent land or areas resulting from the performance of the Work.

2. Should any claim be made by any such owner or occupant because of the performance of the Work, Contractor shall promptly settle with such other party by negotiation or otherwise resolve the claim by arbitration or other dispute resolution proceeding or at law.

3. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any claim or action, legal or equitable, brought by any such owner or occupant against Owner, Engineer, or any other party indemnified hereunder to the extent caused by or based upon Contractor's performance of the Work.

B. *Removal of Debris During Performance of the Work:* During the progress of the Work Contractor shall keep the Site and other areas free from accumulations of waste materials, rubbish, and other debris. Removal and disposal of such waste materials, rubbish, and other debris shall conform to applicable Laws and Regulations.

C. *Cleaning:* Prior to Substantial Completion of the Work Contractor shall clean the Site and the Work and make it ready for utilization by Owner. At the completion of the Work Contractor shall remove from the Site all tools, appliances, construction equipment and machinery, and surplus materials and shall restore to original condition all property not designated for alteration by the Contract Documents.

D. *Loading Structures:* Contractor shall not load nor permit any part of any structure to be loaded in any manner that will endanger the structure, nor shall Contractor subject any part of the Work or adjacent property to stresses or pressures that will endanger it.

6.12 *Record Documents*

A. Contractor shall maintain in a safe place at the Site one record copy of all Drawings, Specifications, Addenda, Change Orders, Work Change Directives, Field Orders, and written interpretations and clarifications in good order and annotated to show changes made during construction. These record documents together with all approved Samples and a counterpart of all approved Shop Drawings will be available to Engineer for reference. Upon completion of the Work, these record documents, Samples, and Shop Drawings will be delivered to Engineer for Owner.

6.13 *Safety and Protection*

A. Contractor shall be solely responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the Work. Such responsibility does not relieve Subcontractors of their responsibility for the safety of persons or property in the performance of their work, nor for compliance with applicable safety Laws and Regulations. Contractor shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury or loss to:

1. all persons on the Site or who may be affected by the Work;

2. all the Work and materials and equipment to be incorporated therein, whether in storage on or off the Site; and

3. other property at the Site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, utilities, and Underground Facilities not designated for removal, relocation, or replacement in the course of construction.

B. Contractor shall comply with all applicable Laws and Regulations relating to the safety of persons or property, or to the protection of persons or property from damage, injury, or loss; and shall erect and maintain all necessary safeguards for such safety and protection. Contractor shall notify owners of adjacent property and of Underground Facilities and other utility owners when prosecution of the Work may affect them, and shall cooperate with them in the protection, removal, relocation, and replacement of their property.

C. Contractor shall comply with the applicable requirements of Owner's safety programs, if any. The Supplementary Conditions identify any Owner's safety programs that are applicable to the Work.

D. Contractor shall inform Owner and Engineer of the specific requirements of Contractor's safety program with which Owner's and Engineer's employees and representatives must comply while at the Site.

E. All damage, injury, or loss to any property referred to in Paragraph 6.13.A.2 or 6.13.A.3 caused, directly or indirectly, in whole or in part, by Contractor, any Subcontractor, Supplier, or any other individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, shall be remedied by Contractor (except damage or loss attributable to the fault of Drawings or Specifications or to the acts or omissions of Owner or Engineer or anyone employed by any of them, or anyone for whose acts any of them may be liable, and not attributable, directly or indirectly, in whole or in part, to the fault or negligence of Contractor or any Subcontractor, Supplier, or other individual or entity directly or indirectly employed by any of them).

F. Contractor's duties and responsibilities for safety and for protection of the Work shall continue until such time as all the Work is completed and Engineer has issued a notice to Owner and Contractor in accordance with Paragraph 14.07.B that the Work is acceptable (except as otherwise expressly provided in connection with Substantial Completion).

6.14 *Safety Representative*

A. Contractor shall designate a qualified and experienced safety representative at the Site whose duties and responsibilities shall be the prevention of accidents and the maintaining and supervising of safety precautions and programs.

6.15 *Hazard Communication Programs*

A. Contractor shall be responsible for coordinating any exchange of material safety data sheets or other hazard communication information required to be made available to or exchanged between or among employers at the Site in accordance with Laws or Regulations.

6.16 *Emergencies*

A. In emergencies affecting the safety or protection of persons or the Work or property at the Site or adjacent thereto, Contractor is obligated to act to prevent threatened damage, injury, or loss. Contractor shall give Engineer prompt written notice if Contractor believes that any significant changes in the Work or variations from the Contract Documents have been caused thereby or are required as a result thereof. If Engineer determines that a change in the Contract Documents is required because of the action taken by Contractor in response to such an emergency, a Work Change Directive or Change Order will be issued.

6.17 *Shop Drawings and Samples*

A. Contractor shall submit Shop Drawings and Samples to Engineer for review and approval in accordance with the accepted Schedule of Submittals (as required by Paragraph 2.07). Each submittal will be identified as Engineer may require.

1. *Shop Drawings:*

a. Submit number of copies specified in the General Requirements.

b. Data shown on the Shop Drawings will be complete with respect to quantities, dimensions, specified performance and design criteria, materials, and similar data to show Engineer the services, materials, and equipment Contractor proposes to provide and to enable Engineer to review the information for the limited purposes required by Paragraph 6.17.D.

2. *Samples:*

a. Submit number of Samples specified in the Specifications.

b. Clearly identify each Sample as to material, Supplier, pertinent data such as catalog numbers, the use for which intended and other data as Engineer may require to enable Engineer to review the submittal for the limited purposes required by Paragraph 6.17.D.

B. Where a Shop Drawing or Sample is required by the Contract Documents or the Schedule of Submittals, any related Work performed prior to Engineer's review and approval of the pertinent submittal will be at the sole expense and responsibility of Contractor.

C. *Submittal Procedures:*

1. Before submitting each Shop Drawing or Sample, Contractor shall have:

a. reviewed and coordinated each Shop Drawing or Sample with other Shop Drawings and Samples and with the requirements of the Work and the Contract Documents;

b. determined and verified all field measurements, quantities, dimensions, specified performance and design criteria, installation requirements, materials, catalog numbers, and similar information with respect thereto;

c. determined and verified the suitability of all materials offered with respect to the indicated application, fabrication, shipping, handling, storage, assembly, and installation pertaining to the performance of the Work; and

d. determined and verified all information relative to Contractor's responsibilities for means, methods, techniques, sequences, and procedures of construction, and safety precautions and programs incident thereto.

2. Each submittal shall bear a stamp or specific written certification that Contractor has satisfied Contractor's obligations under the Contract Documents with respect to Contractor's review and approval of that submittal.

3. With each submittal, Contractor shall give Engineer specific written notice of any variations that the Shop Drawing or Sample may have from the requirements of the Contract Documents. This notice shall be both a written communication separate from the Shop Drawings or Sample submittal; and, in addition, by a specific notation made on each Shop Drawing or Sample submitted to Engineer for review and approval of each such variation.

D. *Engineer's Review:*

1. Engineer will provide timely review of Shop Drawings and Samples in accordance with the Schedule of Submittals acceptable to Engineer. Engineer's review and approval will be only to determine if the items covered by the submittals will, after installation or incorporation in the Work, conform to the information given in the Contract Documents and be compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents.

2. Engineer's review and approval will not extend to means, methods, techniques, sequences, or procedures of construction (except where a particular means, method, technique, sequence, or procedure of construction is specifically and expressly called for by the Contract Documents) or to safety precautions or programs incident thereto. The review and approval of a separate item as such will not indicate approval of the assembly in which the item functions.

3. Engineer's review and approval shall not relieve Contractor from responsibility for any variation from the requirements of the Contract Documents unless Contractor has complied with the requirements of Paragraph 6.17.C.3 and Engineer has given written approval of each such variation by specific written notation thereof incorporated in or accompanying the Shop Drawing or Sample. Engineer's review and approval shall not relieve Contractor from responsibility for complying with the requirements of Paragraph 6.17.C.1.

E. *Resubmittal Procedures:*

1. Contractor shall make corrections required by Engineer and shall return the required number of corrected copies of Shop Drawings and submit, as required, new Samples for review and approval. Contractor shall direct specific attention in writing to revisions other than the corrections called for by Engineer on previous submittals.

6.18 *Continuing the Work*

A. Contractor shall carry on the Work and adhere to the Progress Schedule during all disputes or disagreements with Owner. No Work shall be delayed or postponed pending resolution of any disputes or disagreements, except as permitted by Paragraph 15.04 or as Owner and Contractor may otherwise agree in writing.

6.19 *Contractor's General Warranty and Guarantee*

A. Contractor warrants and guarantees to Owner that all Work will be in accordance with the Contract Documents and will not be defective. Engineer and its officers, directors, members, partners, employees, agents, consultants, and subcontractors shall be entitled to rely on representation of Contractor's warranty and guarantee.

B. Contractor's warranty and guarantee hereunder excludes defects or damage caused by:

1. abuse, modification, or improper maintenance or operation by persons other than Contractor, Subcontractors, Suppliers, or any other individual or entity for whom Contractor is responsible; or

2. normal wear and tear under normal usage.

C. Contractor's obligation to perform and complete the Work in accordance with the Contract Documents shall be absolute. None of the following will constitute an acceptance of Work that is not in accordance with the Contract Documents or a release of Contractor's obligation to perform the Work in accordance with the Contract Documents:

1. observations by Engineer;

2. recommendation by Engineer or payment by Owner of any progress or final payment;

3. the issuance of a certificate of Substantial Completion by Engineer or any payment related thereto by Owner;

4. use or occupancy of the Work or any part thereof by Owner;

5. any review and approval of a Shop Drawing or Sample submittal or the issuance of a notice of acceptability by Engineer;

6. any inspection, test, or approval by others; or

7. any correction of defective Work by Owner.

6.20 *Indemnification*

A. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to the performance of the Work, provided that any such claim, cost, loss, or damage is attributable to bodily injury, sickness, disease, or death, or to injury to or destruction of tangible property (other than the Work itself), including the loss of use resulting therefrom but only to the extent caused by any negligent act or omission of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work or anyone for whose acts any of them may be liable .

B. In any and all claims against Owner or Engineer or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors by any employee (or the survivor or personal representative of such employee) of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, the indemnification obligation under Paragraph 6.20.A shall not be limited in any way by any limitation on the amount or type of damages, compensation, or benefits payable by or for Contractor or any such Subcontractor, Supplier, or other individual or entity under workers' compensation acts, disability benefit acts, or other employee benefit acts.

C. The indemnification obligations of Contractor under Paragraph 6.20.A shall not extend to the liability of Engineer and Engineer's officers, directors, members, partners, employees, agents, consultants and subcontractors arising out of:

1. the preparation or approval of, or the failure to prepare or approve maps, Drawings, opinions, reports, surveys, Change Orders, designs, or Specifications; or

2. giving directions or instructions, or failing to give them, if that is the primary cause of the injury or damage.

6.21 *Delegation of Professional Design Services*

A. Contractor will not be required to provide professional design services unless such services are specifically required by the Contract Documents for a portion of the Work or unless such services are required to carry out Contractor's responsibilities for construction means, methods, techniques, sequences and procedures. Contractor shall not be required to provide professional services in violation of applicable law.

B. If professional design services or certifications by a design professional related to systems, materials or equipment are specifically required of Contractor by the Contract Documents, Owner and Engineer will specify all performance and design criteria that such services must satisfy. Contractor shall cause such services or certifications to be provided by a properly licensed professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, Shop Drawings and other submittals prepared by such professional. Shop Drawings and other submittals related to the Work designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to Engineer.

C. Owner and Engineer shall be entitled to rely upon the adequacy, accuracy and completeness of the services, certifications or approvals performed by such design professionals, provided Owner and Engineer have specified to Contractor all performance and design criteria that such services must satisfy.

D. Pursuant to this Paragraph 6.21, Engineer's review and approval of design calculations and design drawings will be only for the limited purpose of checking for conformance with performance and design criteria given and the design

concept expressed in the Contract Documents. Engineer's review and approval of Shop Drawings and other submittals (except design calculations and design drawings) will be only for the purpose stated in Paragraph 6.17.D.1.

E. Contractor shall not be responsible for the adequacy of the performance or design criteria required by the Contract Documents.

ARTICLE 7 – OTHER WORK AT THE SITE

7.01 *Related Work at Site*

A. Owner may perform other work related to the Project at the Site with Owner's employees, or through other direct contracts therefor, or have other work performed by utility owners. If such other work is not noted in the Contract Documents, then:

1. written notice thereof will be given to Contractor prior to starting any such other work; and

2. if Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times that should be allowed as a result of such other work, a Claim may be made therefor as provided in Paragraph 10.05.

B. Contractor shall afford each other contractor who is a party to such a direct contract, each utility owner, and Owner, if Owner is performing other work with Owner's employees, proper and safe access to the Site, provide a reasonable opportunity for the introduction and storage of materials and equipment and the execution of such other work, and properly coordinate the Work with theirs. Contractor shall do all cutting, fitting, and patching of the Work that may be required to properly connect or otherwise make its several parts come together and properly integrate with such other work. Contractor shall not endanger any work of others by cutting, excavating, or otherwise altering such work; provided, however, that Contractor may cut or alter others' work with the written consent of Engineer and the others whose work will be affected. The duties and responsibilities of Contractor under this Paragraph are for the benefit of such utility owners and other contractors to the extent that there are comparable provisions for the benefit of Contractor in said direct contracts between Owner and such utility owners and other contractors.

C. If the proper execution or results of any part of Contractor's Work depends upon work performed by others under this Article 7, Contractor shall inspect such other work and promptly report to Engineer in writing any delays, defects, or deficiencies in such other work that render it unavailable or unsuitable for the proper execution and results of Contractor's Work. Contractor's failure to so report will constitute an acceptance of such other work as fit and proper for integration with Contractor's Work except for latent defects and deficiencies in such other work.

7.02 *Coordination*

A. If Owner intends to contract with others for the performance of other work on the Project at the Site, the following will be set forth in Supplementary Conditions:

1. the individual or entity who will have authority and responsibility for coordination of the activities among the various contractors will be identified;

2. the specific matters to be covered by such authority and responsibility will be itemized; and

3. the extent of such authority and responsibilities will be provided.

B. Unless otherwise provided in the Supplementary Conditions, Owner shall have sole authority and responsibility for such coordination.

7.03 *Legal Relationships*

A. Paragraphs 7.01.A and 7.02 are not applicable for utilities not under the control of Owner.

B. Each other direct contract of Owner under Paragraph 7.01.A shall provide that the other contractor is liable to Owner and Contractor for the reasonable direct delay and disruption costs incurred by Contractor as a result of the other contractor's wrongful actions or inactions.

C. Contractor shall be liable to Owner and any other contractor under direct contract to Owner for the reasonable direct delay and disruption costs incurred by such other contractor as a result of Contractor's wrongful action or inactions.

ARTICLE 8 – OWNER'S RESPONSIBILITIES

8.01 *Communications to Contractor*

A. Except as otherwise provided in these General Conditions, Owner shall issue all communications to Contractor through Engineer.

8.02 *Replacement of Engineer*

A. In case of termination of the employment of Engineer, Owner shall appoint an engineer to whom Contractor makes no reasonable objection, whose status under the Contract Documents shall be that of the former Engineer.

8.03 *Furnish Data*

A. Owner shall promptly furnish the data required of Owner under the Contract Documents.

8.04 *Pay When Due*

A. Owner shall make payments to Contractor when they are due as provided in Paragraphs 14.02.C and 14.07.C.

8.05 *Lands and Easements; Reports and Tests*

A. Owner's duties with respect to providing lands and easements and providing engineering surveys to establish reference points are set forth in Paragraphs 4.01 and 4.05. Paragraph 4.02 refers to Owner's identifying and making available to Contractor copies of reports of explorations and tests of subsurface conditions and drawings of physical conditions relating to existing surface or subsurface structures at the Site.

8.06 *Insurance*

A. Owner's responsibilities, if any, with respect to purchasing and maintaining liability and property insurance are set forth in Article 5.

8.07 *Change Orders*

A. Owner is obligated to execute Change Orders as indicated in Paragraph 10.03.

8.08 *Inspections, Tests, and Approvals*

A. Owner's responsibility with respect to certain inspections, tests, and approvals is set forth in Paragraph 13.03.B.

8.09 *Limitations on Owner's Responsibilities*

A. The Owner shall not supervise, direct, or have control or authority over, nor be responsible for, Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Owner will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.

8.10 *Undisclosed Hazardous Environmental Condition*

A. Owner's responsibility in respect to an undisclosed Hazardous Environmental Condition is set forth in Paragraph 4.06.

8.11 *Evidence of Financial Arrangements*

A. Upon request of Contractor, Owner shall furnish Contractor reasonable evidence that financial arrangements have been made to satisfy Owner's obligations under the Contract Documents.

8.12 *Compliance with Safety Program*

A. While at the Site, Owner's employees and representatives shall comply with the specific applicable requirements of Contractor's safety programs of which Owner has been informed pursuant to Paragraph 6.13.D.

ARTICLE 9 – ENGINEER'S STATUS DURING CONSTRUCTION

9.01 *Owner's Representative*

A. Engineer will be Owner's representative during the construction period. The duties and responsibilities and the limitations of authority of Engineer as Owner's representative during construction are set forth in the Contract Documents.

9.02 *Visits to Site*

A. Engineer will make visits to the Site at intervals appropriate to the various stages of construction as Engineer deems necessary in order to observe as an experienced and qualified design professional the progress that has been made and the quality of the various aspects of Contractor's executed Work. Based on information obtained during such visits and observations, Engineer, for the benefit of Owner, will determine, in general, if the Work is proceeding in accordance with the Contract Documents. Engineer will not be required to make exhaustive or continuous inspections on the Site to check the quality or quantity of the Work. Engineer's efforts will be directed toward providing for Owner a greater degree of confidence that the completed Work will conform generally to the Contract Documents. On the basis of such visits and observations, Engineer will keep Owner informed of the progress of the Work and will endeavor to guard Owner against defective Work.

B. Engineer's visits and observations are subject to all the limitations on Engineer's authority and responsibility set forth in Paragraph 9.09. Particularly, but without limitation, during or as a result of Engineer's visits or observations of Contractor's Work, Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work.

9.03 *Project Representative*

A. If Owner and Engineer agree, Engineer will furnish a Resident Project Representative to assist Engineer in providing more extensive observation of the Work. The authority and responsibilities of any such Resident Project Representative and assistants will be as provided in the Supplementary Conditions, and limitations on the responsibilities thereof will be as provided in Paragraph 9.09. If Owner designates another representative or agent to represent Owner at the Site who is not Engineer's consultant, agent or employee, the responsibilities and authority and limitations thereon of such other individual or entity will be as provided in the Supplementary Conditions.

9.04 *Authorized Variations in Work*

A. Engineer may authorize minor variations in the Work from the requirements of the Contract Documents which do not involve an adjustment in the Contract Price or the Contract Times and are compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. These may be accomplished by a

Field Order and will be binding on Owner and also on Contractor, who shall perform the Work involved promptly. If Owner or Contractor believes that a Field Order justifies an adjustment in the Contract Price or Contract Times, or both, and the parties are unable to agree on entitlement to or on the amount or extent, if any, of any such adjustment, a Claim may be made therefor as provided in Paragraph 10.05.

9.05 *Rejecting Defective Work*

A. Engineer will have authority to reject Work which Engineer believes to be defective, or that Engineer believes will not produce a completed Project that conforms to the Contract Documents or that will prejudice the integrity of the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. Engineer will also have authority to require special inspection or testing of the Work as provided in Paragraph 13.04, whether or not the Work is fabricated, installed, or completed.

9.06 *Shop Drawings, Change Orders and Payments*

A. In connection with Engineer's authority, and limitations thereof, as to Shop Drawings and Samples, see Paragraph 6.17.

B. In connection with Engineer's authority, and limitations thereof, as to design calculations and design drawings submitted in response to a delegation of professional design services, if any, see Paragraph 6.21.

C. In connection with Engineer's authority as to Change Orders, see Articles 10, 11, and 12.

D. In connection with Engineer's authority as to Applications for Payment, see Article 14.

9.07 *Determinations for Unit Price Work*

A. Engineer will determine the actual quantities and classifications of Unit Price Work performed by Contractor. Engineer will review with Contractor the Engineer's preliminary determinations on such matters before rendering a written decision thereon (by recommendation of an Application for Payment or otherwise). Engineer's written decision thereon will be final and binding (except as modified by Engineer to reflect changed factual conditions or more accurate data) upon Owner and Contractor, subject to the provisions of Paragraph 10.05.

9.08 *Decisions on Requirements of Contract Documents and Acceptability of Work*

A. Engineer will be the initial interpreter of the requirements of the Contract Documents and judge of the acceptability of the Work thereunder. All matters in question and other matters between Owner and Contractor arising prior to the date final payment is due relating to the acceptability of the Work, and the interpretation of the requirements of the Contract Documents pertaining to the performance of the Work, will be referred initially to Engineer in writing within 30 days of the event giving rise to the question.

B. Engineer will, with reasonable promptness, render a written decision on the issue referred. If Owner or Contractor believes that any such decision entitles them to an adjustment in the Contract Price or Contract Times or both, a Claim may be made under Paragraph 10.05. The date of Engineer's decision shall be the date of the event giving rise to the issues referenced for the purposes of Paragraph 10.05.B.

C. Engineer's written decision on the issue referred will be final and binding on Owner and Contractor, subject to the provisions of Paragraph 10.05.

D. When functioning as interpreter and judge under this Paragraph 9.08, Engineer will not show partiality to Owner or Contractor and will not be liable in connection with any interpretation or decision rendered in good faith in such capacity.

9.09 *Limitations on Engineer's Authority and Responsibilities*

A. Neither Engineer's authority or responsibility under this Article 9 or under any other provision of the Contract Documents nor any decision made by Engineer in good faith either to exercise or not exercise such authority or responsibility or the undertaking, exercise, or performance of any authority or responsibility by Engineer shall create, impose, or give rise to any duty in contract, tort, or otherwise owed by Engineer to Contractor, any Subcontractor, any Supplier, any other individual or entity, or to any surety for or employee or agent of any of them.

B. Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Engineer will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.

C. Engineer will not be responsible for the acts or omissions of Contractor or of any Subcontractor, any Supplier, or of any other individual or entity performing any of the Work.

D. Engineer's review of the final Application for Payment and accompanying documentation and all maintenance and operating instructions, schedules, guarantees, bonds, certificates of inspection, tests and approvals, and other documentation required to be delivered by Paragraph 14.07.A will only be to determine generally that their content complies with the requirements of, and in the case of certificates of inspections, tests, and approvals that the results certified indicate compliance with, the Contract Documents.

E. The limitations upon authority and responsibility set forth in this Paragraph 9.09 shall also apply to the Resident Project Representative, if any, and assistants, if any.

9.10 *Compliance with Safety Program*

A. While at the Site, Engineer's employees and representatives shall comply with the specific applicable requirements of Contractor's safety programs of which Engineer has been informed pursuant to Paragraph 6.13.D.

ARTICLE 10 – CHANGES IN THE WORK; CLAIMS

10.01 *Authorized Changes in the Work*

A. Without invalidating the Contract and without notice to any surety, Owner may, at any time or from time to time, order additions, deletions, or revisions in the Work by a Change Order, or a Work Change Directive. Upon receipt of any such document, Contractor shall promptly proceed with the Work involved which will be performed under the applicable conditions of the Contract Documents (except as otherwise specifically provided).

B. If Owner and Contractor are unable to agree on entitlement to, or on the amount or extent, if any, of an adjustment in the Contract Price or Contract Times, or both, that should be allowed as a result of a Work Change Directive, a Claim may be made therefor as provided in Paragraph 10.05.

10.02 *Unauthorized Changes in the Work*

A. Contractor shall not be entitled to an increase in the Contract Price or an extension of the Contract Times with respect to any work performed that is not required by the Contract Documents as amended, modified, or supplemented as provided in Paragraph 3.04, except in the case of an emergency as provided in Paragraph 6.16 or in the case of uncovering Work as provided in Paragraph 13.04.D.

10.03 *Execution of Change Orders*

A. Owner and Contractor shall execute appropriate Change Orders recommended by Engineer covering:

1. changes in the Work which are: (i) ordered by Owner pursuant to Paragraph 10.01.A, (ii) required because of acceptance of defective Work under Paragraph 13.08.A or Owner's correction of defective Work under Paragraph 13.09, or (iii) agreed to by the parties;

2. changes in the Contract Price or Contract Times which are agreed to by the parties, including any undisputed sum or amount of time for Work actually performed in accordance with a Work Change Directive; and

3. changes in the Contract Price or Contract Times which embody the substance of any written decision rendered by Engineer pursuant to Paragraph 10.05; provided that, in lieu of executing any such Change Order, an appeal may be taken from any such decision in accordance with the provisions of the Contract Documents and applicable Laws and Regulations, but during any such appeal, Contractor shall carry on the Work and adhere to the Progress Schedule as provided in Paragraph 6.18.A.

10.04 *Notification to Surety*

A. If the provisions of any bond require notice to be given to a surety of any change affecting the general scope of the Work or the provisions of the Contract Documents (including, but not limited to, Contract Price or Contract Times), the giving of any such notice will be Contractor's responsibility. The amount of each applicable bond will be adjusted to reflect the effect of any such change.

10.05 *Claims*

A. *Engineer's Decision Required*: All Claims, except those waived pursuant to Paragraph 14.09, shall be referred to the Engineer for decision. A decision by Engineer shall be required as a condition precedent to any exercise by Owner or Contractor of any rights or remedies either may otherwise have under the Contract Documents or by Laws and Regulations in respect of such Claims.

B. *Notice:* Written notice stating the general nature of each Claim shall be delivered by the claimant to Engineer and the other party to the Contract promptly (but in no event later than 30 days) after the start of the event giving rise thereto. The responsibility to substantiate a Claim shall rest with the party making the Claim. Notice of the amount or extent of the Claim, with supporting data shall be delivered to the Engineer and the other party to the Contract within 60 days after the start of such event (unless Engineer allows additional time for claimant to submit additional or more accurate data in support of such Claim). A Claim for an adjustment in Contract Price shall be prepared in accordance with the provisions of Paragraph 12.01.B. A Claim for an adjustment in Contract Times shall be prepared in accordance with the provisions of Paragraph 12.02.B. Each Claim shall be accompanied by claimant's written statement that the adjustment claimed is the entire adjustment to which the claimant believes it is entitled as a result of said event. The opposing party shall submit any response to Engineer and the claimant within 30 days after receipt of the claimant's last submittal (unless Engineer allows additional time).

C. *Engineer's Action*: Engineer will review each Claim and, within 30 days after receipt of the last submittal of the claimant or the last submittal of the opposing party, if any, take one of the following actions in writing:

1. deny the Claim in whole or in part;

2. approve the Claim; or

3. notify the parties that the Engineer is unable to resolve the Claim if, in the Engineer's sole discretion, it would be inappropriate for the Engineer to do so. For purposes of further resolution of the Claim, such notice shall be deemed a denial.

D. In the event that Engineer does not take action on a Claim within said 30 days, the Claim shall be deemed denied.

E. Engineer's written action under Paragraph 10.05.C or denial pursuant to Paragraphs 10.05.C.3 or 10.05.D will be final and binding upon Owner and Contractor, unless Owner or Contractor invoke the dispute resolution procedure set forth in Article 16 within 30 days of such action or denial.

F. No Claim for an adjustment in Contract Price or Contract Times will be valid if not submitted in accordance with this Paragraph 10.05.

ARTICLE 11 – COST OF THE WORK; ALLOWANCES; UNIT PRICE WORK

11.01 *Cost of the Work*

A. *Costs Included:* The term Cost of the Work means the sum of all costs, except those excluded in Paragraph 11.01.B, necessarily incurred and paid by Contractor in the proper performance of the Work. When the value of any Work covered by a Change Order or when a Claim for an adjustment in Contract Price is determined on the basis of Cost of the Work, the costs to be reimbursed to Contractor will be only those additional or incremental costs required because of the change in the Work or because of the event giving rise to the Claim. Except as otherwise may be agreed to in writing by Owner, such costs shall be in amounts no higher than those prevailing in the locality of the Project, shall not include any of the costs itemized in Paragraph 11.01.B, and shall include only the following items:

1. Payroll costs for employees in the direct employ of Contractor in the performance of the Work under schedules of job classifications agreed upon by Owner and Contractor. Such employees shall include, without limitation, superintendents, foremen, and other personnel employed full time on the Work. Payroll costs for employees not employed full time on the Work shall be apportioned on the basis of their time spent on the Work. Payroll costs shall include, but not be limited to, salaries and wages plus the cost of fringe benefits, which shall include social security contributions, unemployment, excise, and payroll taxes, workers' compensation, health and retirement benefits, bonuses, sick leave, vacation and holiday pay applicable thereto. The expenses of performing Work outside of regular working hours, on Saturday, Sunday, or legal holidays, shall be included in the above to the extent authorized by Owner.

2. Cost of all materials and equipment furnished and incorporated in the Work, including costs of transportation and storage thereof, and Suppliers' field services required in connection therewith. All cash discounts shall accrue to Contractor unless Owner deposits funds with Contractor with which to make payments, in which case the cash discounts shall accrue to Owner. All trade discounts, rebates and refunds and returns from sale of surplus materials and equipment shall accrue to Owner, and Contractor shall make provisions so that they may be obtained.

3. Payments made by Contractor to Subcontractors for Work performed by Subcontractors. If required by Owner, Contractor shall obtain competitive bids from subcontractors acceptable to Owner and Contractor and shall deliver such bids to Owner, who will then determine, with the advice of Engineer, which bids, if any, will be acceptable. If any subcontract provides that the Subcontractor is to be paid on the basis of Cost of the Work plus a fee, the Subcontractor's Cost of the Work and fee shall be determined in the same manner as Contractor's Cost of the Work and fee as provided in this Paragraph 11.01.

4. Costs of special consultants (including but not limited to engineers, architects, testing laboratories, surveyors, attorneys, and accountants) employed for services specifically related to the Work.

5. Supplemental costs including the following:

    a. The proportion of necessary transportation, travel, and subsistence expenses of Contractor's employees incurred in discharge of duties connected with the Work.

    b. Cost, including transportation and maintenance, of all materials, supplies, equipment, machinery, appliances, office, and temporary facilities at the Site, and hand tools not owned by the workers, which are consumed in the performance of the Work, and cost, less market value, of such items used but not consumed which remain the property of Contractor.

    c. Rentals of all construction equipment and machinery, and the parts thereof whether rented from Contractor or others in accordance with rental agreements approved by Owner with the advice of Engineer, and the costs of transportation, loading, unloading, assembly, dismantling, and removal thereof. All such costs shall be in accordance with the terms of said rental agreements. The rental of any such equipment, machinery, or parts shall cease when the use thereof is no longer necessary for the Work.

d. Sales, consumer, use, and other similar taxes related to the Work, and for which Contractor is liable, as imposed by Laws and Regulations.

e. Deposits lost for causes other than negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, and royalty payments and fees for permits and licenses.

f. Losses and damages (and related expenses) caused by damage to the Work, not compensated by insurance or otherwise, sustained by Contractor in connection with the performance of the Work (except losses and damages within the deductible amounts of property insurance established in accordance with Paragraph 5.06.D), provided such losses and damages have resulted from causes other than the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable. Such losses shall include settlements made with the written consent and approval of Owner. No such losses, damages, and expenses shall be included in the Cost of the Work for the purpose of determining Contractor's fee.

g. The cost of utilities, fuel, and sanitary facilities at the Site.

h. Minor expenses such as telegrams, long distance telephone calls, telephone service at the Site, express and courier services, and similar petty cash items in connection with the Work.

i. The costs of premiums for all bonds and insurance Contractor is required by the Contract Documents to purchase and maintain.

B. *Costs Excluded:* The term Cost of the Work shall not include any of the following items:

1. Payroll costs and other compensation of Contractor's officers, executives, principals (of partnerships and sole proprietorships), general managers, safety managers, engineers, architects, estimators, attorneys, auditors, accountants, purchasing and contracting agents, expediters, timekeepers, clerks, and other personnel employed by Contractor, whether at the Site or in Contractor's principal or branch office for general administration of the Work and not specifically included in the agreed upon schedule of job classifications referred to in Paragraph 11.01.A.1 or specifically covered by Paragraph 11.01.A.4, all of which are to be considered administrative costs covered by the Contractor's fee.

2. Expenses of Contractor's principal and branch offices other than Contractor's office at the Site.

3. Any part of Contractor's capital expenses, including interest on Contractor's capital employed for the Work and charges against Contractor for delinquent payments.

4. Costs due to the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, including but not limited to, the correction of defective Work, disposal of materials or equipment wrongly supplied, and making good any damage to property.

5. Other overhead or general expense costs of any kind and the costs of any item not specifically and expressly included in Paragraphs 11.01.A.

C. *Contractor's Fee:* When all the Work is performed on the basis of cost-plus, Contractor's fee shall be determined as set forth in the Agreement. When the value of any Work covered by a Change Order or when a Claim for an adjustment in Contract Price is determined on the basis of Cost of the Work, Contractor's fee shall be determined as set forth in Paragraph 12.01.C.

D. *Documentation:* Whenever the Cost of the Work for any purpose is to be determined pursuant to Paragraphs 11.01.A and 11.01.B, Contractor will establish and maintain records thereof in accordance with generally accepted accounting practices and submit in a form acceptable to Engineer an itemized cost breakdown together with supporting data.

11.02 *Allowances*

A. It is understood that Contractor has included in the Contract Price all allowances so named in the Contract Documents and shall cause the Work so covered to be performed for such sums and by such persons or entities as may be acceptable to Owner and Engineer.

B. *Cash Allowances:*

1. Contractor agrees that:

a. the cash allowances include the cost to Contractor (less any applicable trade discounts) of materials and equipment required by the allowances to be delivered at the Site, and all applicable taxes; and

b. Contractor's costs for unloading and handling on the Site, labor, installation, overhead, profit, and other expenses contemplated for the cash allowances have been included in the Contract Price and not in the allowances, and no demand for additional payment on account of any of the foregoing will be valid.

C. *Contingency Allowance:*

1. Contractor agrees that a contingency allowance, if any, is for the sole use of Owner to cover unanticipated costs.

D. Prior to final payment, an appropriate Change Order will be issued as recommended by Engineer to reflect actual amounts due Contractor on account of Work covered by allowances, and the Contract Price shall be correspondingly adjusted.

11.03 *Unit Price Work*

A. Where the Contract Documents provide that all or part of the Work is to be Unit Price Work, initially the Contract Price will be deemed to include for all Unit Price Work an amount equal to the sum of the unit price for each separately identified item of Unit Price Work times the estimated quantity of each item as indicated in the Agreement.

B. The estimated quantities of items of Unit Price Work are not guaranteed and are solely for the purpose of comparison of Bids and determining an initial Contract Price. Determinations of the actual quantities and classifications of Unit Price Work performed by Contractor will be made by Engineer subject to the provisions of Paragraph 9.07.

C. Each unit price will be deemed to include an amount considered by Contractor to be adequate to cover Contractor's overhead and profit for each separately identified item.

D. Owner or Contractor may make a Claim for an adjustment in the Contract Price in accordance with Paragraph 10.05 if:

1. the quantity of any item of Unit Price Work performed by Contractor differs materially and significantly from the estimated quantity of such item indicated in the Agreement; and

2. there is no corresponding adjustment with respect to any other item of Work; and

3. Contractor believes that Contractor is entitled to an increase in Contract Price as a result of having incurred additional expense or Owner believes that Owner is entitled to a decrease in Contract Price and the parties are unable to agree as to the amount of any such increase or decrease.

ARTICLE 12 – CHANGE OF CONTRACT PRICE; CHANGE OF CONTRACT TIMES

12.01 *Change of Contract Price*

A. The Contract Price may only be changed by a Change Order. Any Claim for an adjustment in the Contract Price shall be based on written notice submitted by the party making the Claim to the Engineer and the other party to the Contract in accordance with the provisions of Paragraph 10.05.

B. The value of any Work covered by a Change Order or of any Claim for an adjustment in the Contract Price will be determined as follows:

1. where the Work involved is covered by unit prices contained in the Contract Documents, by application of such unit prices to the quantities of the items involved (subject to the provisions of Paragraph 11.03); or

2. where the Work involved is not covered by unit prices contained in the Contract Documents, by a mutually agreed lump sum (which may include an allowance for overhead and profit not necessarily in accordance with Paragraph 12.01.C.2); or

3. where the Work involved is not covered by unit prices contained in the Contract Documents and agreement to a lump sum is not reached under Paragraph 12.01.B.2, on the basis of the Cost of the Work (determined as provided in Paragraph 11.01) plus a Contractor's fee for overhead and profit (determined as provided in Paragraph 12.01.C).

C. *Contractor's Fee:* The Contractor's fee for overhead and profit shall be determined as follows:

1. a mutually acceptable fixed fee; or

2. if a fixed fee is not agreed upon, then a fee based on the following percentages of the various portions of the Cost of the Work:

a. for costs incurred under Paragraphs 11.01.A.1 and 11.01.A.2, the Contractor's fee shall be 15 percent;

b. for costs incurred under Paragraph 11.01.A.3, the Contractor's fee shall be five percent;

c. where one or more tiers of subcontracts are on the basis of Cost of the Work plus a fee and no fixed fee is agreed upon, the intent of Paragraphs 12.01.C.2.a and 12.01.C.2.b is that the Subcontractor who actually performs the Work, at whatever tier, will be paid a fee of 15 percent of the costs incurred by such Subcontractor under Paragraphs 11.01.A.1 and 11.01.A.2 and that any higher tier Subcontractor and Contractor will each be paid a fee of five percent of the amount paid to the next lower tier Subcontractor;

d. no fee shall be payable on the basis of costs itemized under Paragraphs 11.01.A.4, 11.01.A.5, and 11.01.B;

e. the amount of credit to be allowed by Contractor to Owner for any change which results in a net decrease in cost will be the amount of the actual net decrease in cost plus a deduction in Contractor's fee by an amount equal to five percent of such net decrease; and

f. when both additions and credits are involved in any one change, the adjustment in Contractor's fee shall be computed on the basis of the net change in accordance with Paragraphs 12.01.C.2.a through 12.01.C.2.e, inclusive.

12.02 *Change of Contract Times*

A. The Contract Times may only be changed by a Change Order. Any Claim for an adjustment in the Contract Times shall be based on written notice submitted by the party making the Claim to the Engineer and the other party to the Contract in accordance with the provisions of Paragraph 10.05.

B. Any adjustment of the Contract Times covered by a Change Order or any Claim for an adjustment in the Contract Times will be determined in accordance with the provisions of this Article 12.

12.03 *Delays*

A. Where Contractor is prevented from completing any part of the Work within the Contract Times due to delay beyond the control of Contractor, the Contract Times will be extended in an amount equal to the time lost due to such delay if a Claim is made therefor as provided in Paragraph 12.02.A. Delays beyond the control of Contractor shall include, but not be limited to, acts or neglect by Owner, acts or neglect of utility owners or other contractors performing other work as contemplated by Article 7, fires, floods, epidemics, abnormal weather conditions, or acts of God.

B. If Owner, Engineer, or other contractors or utility owners performing other work for Owner as contemplated by Article 7, or anyone for whom Owner is responsible, delays, disrupts, or interferes with the performance or progress of the Work, then Contractor shall be entitled to an equitable adjustment in the Contract Price or the Contract Times, or both. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times.

C. If Contractor is delayed in the performance or progress of the Work by fire, flood, epidemic, abnormal weather conditions, acts of God, acts or failures to act of utility owners not under the control of Owner, or other causes not the fault of and beyond control of Owner and Contractor, then Contractor shall be entitled to an equitable adjustment in Contract Times, if such adjustment is essential to Contractor's ability to complete the Work within the Contract Times. Such an adjustment shall be Contractor's sole and exclusive remedy for the delays described in this Paragraph 12.03.C.

D. Owner, Engineer, and their officers, directors, members, partners, employees, agents, consultants, or subcontractors shall not be liable to Contractor for any claims, costs, losses, or damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by Contractor on or in connection with any other project or anticipated project.

E. Contractor shall not be entitled to an adjustment in Contract Price or Contract Times for delays within the control of Contractor. Delays attributable to and within the control of a Subcontractor or Supplier shall be deemed to be delays within the control of Contractor.

ARTICLE 13 – TESTS AND INSPECTIONS; CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK

13.01 *Notice of Defects*

A. Prompt notice of all defective Work of which Owner or Engineer has actual knowledge will be given to Contractor. Defective Work may be rejected, corrected, or accepted as provided in this Article 13.

13.02 *Access to Work*

A. Owner, Engineer, their consultants and other representatives and personnel of Owner, independent testing laboratories, and governmental agencies with jurisdictional interests will have access to the Site and the Work at reasonable times for their observation, inspection, and testing. Contractor shall provide them proper and safe conditions for such access and advise them of Contractor's safety procedures and programs so that they may comply therewith as applicable.

13.03 *Tests and Inspections*

A. Contractor shall give Engineer timely notice of readiness of the Work for all required inspections, tests, or approvals and shall cooperate with inspection and testing personnel to facilitate required inspections or tests.

B. Owner shall employ and pay for the services of an independent testing laboratory to perform all inspections, tests, or approvals required by the Contract Documents except:

1. for inspections, tests, or approvals covered by Paragraphs 13.03.C and 13.03.D below;

2. that costs incurred in connection with tests or inspections conducted pursuant to Paragraph 13.04.B shall be paid as provided in Paragraph 13.04.C; and

3. as otherwise specifically provided in the Contract Documents.

C. If Laws or Regulations of any public body having jurisdiction require any Work (or part thereof) specifically to be inspected, tested, or approved by an employee or other representative of such public body, Contractor shall assume full responsibility for arranging and obtaining such inspections, tests, or approvals, pay all costs in connection therewith, and furnish Engineer the required certificates of inspection or approval.

D. Contractor shall be responsible for arranging and obtaining and shall pay all costs in connection with any inspections, tests, or approvals required for Owner's and Engineer's acceptance of materials or equipment to be incorporated in the Work; or acceptance of materials, mix designs, or equipment submitted for approval prior to Contractor's purchase thereof for incorporation in the Work. Such inspections, tests, or approvals shall be performed by organizations acceptable to Owner and Engineer.

E. If any Work (or the work of others) that is to be inspected, tested, or approved is covered by Contractor without written concurrence of Engineer, Contractor shall, if requested by Engineer, uncover such Work for observation.

F. Uncovering Work as provided in Paragraph 13.03.E shall be at Contractor's expense unless Contractor has given Engineer timely notice of Contractor's intention to cover the same and Engineer has not acted with reasonable promptness in response to such notice.

13.04 *Uncovering Work*

A. If any Work is covered contrary to the written request of Engineer, it must, if requested by Engineer, be uncovered for Engineer's observation and replaced at Contractor's expense.

B. If Engineer considers it necessary or advisable that covered Work be observed by Engineer or inspected or tested by others, Contractor, at Engineer's request, shall uncover, expose, or otherwise make available for observation, inspection, or testing as Engineer may require, that portion of the Work in question, furnishing all necessary labor, material, and equipment.

C. If it is found that the uncovered Work is defective, Contractor shall pay all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such uncovering, exposure, observation, inspection, and testing, and of satisfactory replacement or reconstruction (including but not limited to all costs of repair or replacement of work of others); and Owner shall be entitled to an appropriate decrease in the Contract Price. If the parties are unable to agree as to the amount thereof, Owner may make a Claim therefor as provided in Paragraph 10.05.

D. If the uncovered Work is not found to be defective, Contractor shall be allowed an increase in the Contract Price or an extension of the Contract Times, or both, directly attributable to such uncovering, exposure, observation, inspection, testing, replacement, and reconstruction. If the parties are unable to agree as to the amount or extent thereof, Contractor may make a Claim therefor as provided in Paragraph 10.05.

13.05 *Owner May Stop the Work*

A. If the Work is defective, or Contractor fails to supply sufficient skilled workers or suitable materials or equipment, or fails to perform the Work in such a way that the completed Work will conform to the Contract Documents, Owner may order Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, this right of Owner to stop the Work shall not give rise to any duty on the part of Owner to exercise this right

for the benefit of Contractor, any Subcontractor, any Supplier, any other individual or entity, or any surety for, or employee or agent of any of them.

13.06 *Correction or Removal of Defective Work*

A. Promptly after receipt of written notice, Contractor shall correct all defective Work, whether or not fabricated, installed, or completed, or, if the Work has been rejected by Engineer, remove it from the Project and replace it with Work that is not defective. Contractor shall pay all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such correction or removal (including but not limited to all costs of repair or replacement of work of others).

B. When correcting defective Work under the terms of this Paragraph 13.06 or Paragraph 13.07, Contractor shall take no action that would void or otherwise impair Owner's special warranty and guarantee, if any, on said Work.

13.07 *Correction Period*

A. If within one year after the date of Substantial Completion (or such longer period of time as may be prescribed by the terms of any applicable special guarantee required by the Contract Documents) or by any specific provision of the Contract Documents, any Work is found to be defective, or if the repair of any damages to the land or areas made available for Contractor's use by Owner or permitted by Laws and Regulations as contemplated in Paragraph 6.11.A is found to be defective, Contractor shall promptly, without cost to Owner and in accordance with Owner's written instructions:

1. repair such defective land or areas; or

2. correct such defective Work; or

3. if the defective Work has been rejected by Owner, remove it from the Project and replace it with Work that is not defective, and

4. satisfactorily correct or repair or remove and replace any damage to other Work, to the work of others or other land or areas resulting therefrom.

B. If Contractor does not promptly comply with the terms of Owner's written instructions, or in an emergency where delay would cause serious risk of loss or damage, Owner may have the defective Work corrected or repaired or may have the rejected Work removed and replaced. All claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such correction or repair or such removal and replacement (including but not limited to all costs of repair or replacement of work of others) will be paid by Contractor.

C. In special circumstances where a particular item of equipment is placed in continuous service before Substantial Completion of all the Work, the correction period for that item may start to run from an earlier date if so provided in the Specifications.

D. Where defective Work (and damage to other Work resulting therefrom) has been corrected or removed and replaced under this Paragraph 13.07, the correction period hereunder with respect to such Work will be extended for an additional period of one year after such correction or removal and replacement has been satisfactorily completed.

E. Contractor's obligations under this Paragraph 13.07 are in addition to any other obligation or warranty. The provisions of this Paragraph 13.07 shall not be construed as a substitute for, or a waiver of, the provisions of any applicable statute of limitation or repose.

13.08 *Acceptance of Defective Work*

A. If, instead of requiring correction or removal and replacement of defective Work, Owner (and, prior to Engineer's recommendation of final payment, Engineer) prefers to accept it, Owner may do so. Contractor shall pay all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) attributable to Owner's evaluation of and determination to accept such defective Work (such costs to be approved by Engineer as to reasonableness) and for the diminished value of the Work to the extent not otherwise paid by Contractor pursuant to this sentence. If any such acceptance occurs prior to Engineer's recommendation of final payment, a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work, and Owner shall be entitled to an appropriate decrease in the Contract Price, reflecting the diminished value of Work so accepted. If the parties are unable to agree as to the amount thereof, Owner may make a Claim therefor as provided in Paragraph 10.05. If the acceptance occurs after such recommendation, an appropriate amount will be paid by Contractor to Owner.

13.09 *Owner May Correct Defective Work*

A. If Contractor fails within a reasonable time after written notice from Engineer to correct defective Work, or to remove and replace rejected Work as required by Engineer in accordance with Paragraph 13.06.A, or if Contractor fails to perform the Work in accordance with the Contract Documents, or if Contractor fails to comply with any other provision of the Contract Documents, Owner may, after seven days written notice to Contractor, correct, or remedy any such deficiency.

B. In exercising the rights and remedies under this Paragraph 13.09, Owner shall proceed expeditiously. In connection with such corrective or remedial action, Owner may exclude Contractor from all or part of the Site, take possession of all or part of the Work and suspend Contractor's services related thereto, take possession of Contractor's tools, appliances, construction equipment and machinery at the Site, and incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere. Contractor shall allow Owner, Owner's representatives, agents and employees, Owner's other contractors, and Engineer and Engineer's consultants access to the Site to enable Owner to exercise the rights and remedies under this Paragraph.

C. All claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) incurred or sustained by Owner in exercising the rights and remedies under this Paragraph 13.09 will be charged against Contractor, and a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work; and Owner shall be entitled to an appropriate decrease in the Contract Price. If the parties are unable to agree as to the amount of the adjustment, Owner may make a Claim therefor as provided in Paragraph 10.05. Such claims, costs, losses and damages will include but not be limited to all costs of repair, or replacement of work of others destroyed or damaged by correction, removal, or replacement of Contractor's defective Work.

D. Contractor shall not be allowed an extension of the Contract Times because of any delay in the performance of the Work attributable to the exercise by Owner of Owner's rights and remedies under this Paragraph 13.09.

ARTICLE 14 – PAYMENTS TO CONTRACTOR AND COMPLETION

14.01 *Schedule of Values*

A. The Schedule of Values established as provided in Paragraph 2.07.A will serve as the basis for progress payments and will be incorporated into a form of Application for Payment acceptable to Engineer. Progress payments on account of Unit Price Work will be based on the number of units completed.

14.02 *Progress Payments*

A. *Applications for Payments:*

1. At least 20 days before the date established in the Agreement for each progress payment (but not more often than once a month), Contractor shall submit to Engineer for review an Application for Payment filled out and signed

by Contractor covering the Work completed as of the date of the Application and accompanied by such supporting documentation as is required by the Contract Documents. If payment is requested on the basis of materials and equipment not incorporated in the Work but delivered and suitably stored at the Site or at another location agreed to in writing, the Application for Payment shall also be accompanied by a bill of sale, invoice, or other documentation warranting that Owner has received the materials and equipment free and clear of all Liens and evidence that the materials and equipment are covered by appropriate property insurance or other arrangements to protect Owner's interest therein, all of which must be satisfactory to Owner.

2. Beginning with the second Application for Payment, each Application shall include an affidavit of Contractor stating that all previous progress payments received on account of the Work have been applied on account to discharge Contractor's legitimate obligations associated with prior Applications for Payment.

3. The amount of retainage with respect to progress payments will be as stipulated in the Agreement.

B. *Review of Applications:*

1. Engineer will, within 10 days after receipt of each Application for Payment, either indicate in writing a recommendation of payment and present the Application to Owner or return the Application to Contractor indicating in writing Engineer's reasons for refusing to recommend payment. In the latter case, Contractor may make the necessary corrections and resubmit the Application.

2. Engineer's recommendation of any payment requested in an Application for Payment will constitute a representation by Engineer to Owner, based on Engineer's observations of the executed Work as an experienced and qualified design professional, and on Engineer's review of the Application for Payment and the accompanying data and schedules, that to the best of Engineer's knowledge, information and belief:

   a. the Work has progressed to the point indicated;

   b. the quality of the Work is generally in accordance with the Contract Documents (subject to an evaluation of the Work as a functioning whole prior to or upon Substantial Completion, the results of any subsequent tests called for in the Contract Documents, a final determination of quantities and classifications for Unit Price Work under Paragraph 9.07, and any other qualifications stated in the recommendation); and

   c. the conditions precedent to Contractor's being entitled to such payment appear to have been fulfilled in so far as it is Engineer's responsibility to observe the Work.

3. By recommending any such payment Engineer will not thereby be deemed to have represented that:

   a. inspections made to check the quality or the quantity of the Work as it has been performed have been exhaustive, extended to every aspect of the Work in progress, or involved detailed inspections of the Work beyond the responsibilities specifically assigned to Engineer in the Contract Documents; or

   b. there may not be other matters or issues between the parties that might entitle Contractor to be paid additionally by Owner or entitle Owner to withhold payment to Contractor.

4. Neither Engineer's review of Contractor's Work for the purposes of recommending payments nor Engineer's recommendation of any payment, including final payment, will impose responsibility on Engineer:

   a. to supervise, direct, or control the Work, or

   b. for the means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or

   c. for Contractor's failure to comply with Laws and Regulations applicable to Contractor's performance of the Work, or

d. to make any examination to ascertain how or for what purposes Contractor has used the moneys paid on account of the Contract Price, or

e. to determine that title to any of the Work, materials, or equipment has passed to Owner free and clear of any Liens.

5. Engineer may refuse to recommend the whole or any part of any payment if, in Engineer's opinion, it would be incorrect to make the representations to Owner stated in Paragraph 14.02.B.2. Engineer may also refuse to recommend any such payment or, because of subsequently discovered evidence or the results of subsequent inspections or tests, revise or revoke any such payment recommendation previously made, to such extent as may be necessary in Engineer's opinion to protect Owner from loss because:

a. the Work is defective, or completed Work has been damaged, requiring correction or replacement;

b. the Contract Price has been reduced by Change Orders;

c. Owner has been required to correct defective Work or complete Work in accordance with Paragraph 13.09; or

d. Engineer has actual knowledge of the occurrence of any of the events enumerated in Paragraph 15.02.A.

C. *Payment Becomes Due:*

1. Ten days after presentation of the Application for Payment to Owner with Engineer's recommendation, the amount recommended will (subject to the provisions of Paragraph 14.02.D) become due, and when due will be paid by Owner to Contractor.

D. *Reduction in Payment:*

1. Owner may refuse to make payment of the full amount recommended by Engineer because:

a. claims have been made against Owner on account of Contractor's performance or furnishing of the Work;

b. Liens have been filed in connection with the Work, except where Contractor has delivered a specific bond satisfactory to Owner to secure the satisfaction and discharge of such Liens;

c. there are other items entitling Owner to a set-off against the amount recommended; or

d. Owner has actual knowledge of the occurrence of any of the events enumerated in Paragraphs 14.02.B.5.a through 14.02.B.5.c or Paragraph 15.02.A.

2. If Owner refuses to make payment of the full amount recommended by Engineer, Owner will give Contractor immediate written notice (with a copy to Engineer) stating the reasons for such action and promptly pay Contractor any amount remaining after deduction of the amount so withheld. Owner shall promptly pay Contractor the amount so withheld, or any adjustment thereto agreed to by Owner and Contractor, when Contractor remedies the reasons for such action.

3. Upon a subsequent determination that Owner's refusal of payment was not justified, the amount wrongfully withheld shall be treated as an amount due as determined by Paragraph 14.02.C.1 and subject to interest as provided in the Agreement.

14.03 *Contractor's Warranty of Title*

A. Contractor warrants and guarantees that title to all Work, materials, and equipment covered by any Application for Payment, whether incorporated in the Project or not, will pass to Owner no later than the time of payment free and clear of all Liens.

14.04 *Substantial Completion*

A. When Contractor considers the entire Work ready for its intended use Contractor shall notify Owner and Engineer in writing that the entire Work is substantially complete (except for items specifically listed by Contractor as incomplete) and request that Engineer issue a certificate of Substantial Completion.

B. Promptly after Contractor's notification, Owner, Contractor, and Engineer shall make an inspection of the Work to determine the status of completion. If Engineer does not consider the Work substantially complete, Engineer will notify Contractor in writing giving the reasons therefor.

C. If Engineer considers the Work substantially complete, Engineer will deliver to Owner a tentative certificate of Substantial Completion which shall fix the date of Substantial Completion. There shall be attached to the certificate a tentative list of items to be completed or corrected before final payment. Owner shall have seven days after receipt of the tentative certificate during which to make written objection to Engineer as to any provisions of the certificate or attached list. If, after considering such objections, Engineer concludes that the Work is not substantially complete, Engineer will, within 14 days after submission of the tentative certificate to Owner, notify Contractor in writing, stating the reasons therefor. If, after consideration of Owner's objections, Engineer considers the Work substantially complete, Engineer will, within said 14 days, execute and deliver to Owner and Contractor a definitive certificate of Substantial Completion (with a revised tentative list of items to be completed or corrected) reflecting such changes from the tentative certificate as Engineer believes justified after consideration of any objections from Owner.

D. At the time of delivery of the tentative certificate of Substantial Completion, Engineer will deliver to Owner and Contractor a written recommendation as to division of responsibilities pending final payment between Owner and Contractor with respect to security, operation, safety, and protection of the Work, maintenance, heat, utilities, insurance, and warranties and guarantees. Unless Owner and Contractor agree otherwise in writing and so inform Engineer in writing prior to Engineer's issuing the definitive certificate of Substantial Completion, Engineer's aforesaid recommendation will be binding on Owner and Contractor until final payment.

E. Owner shall have the right to exclude Contractor from the Site after the date of Substantial Completion subject to allowing Contractor reasonable access to remove its property and complete or correct items on the tentative list.

14.05 *Partial Utilization*

A. Prior to Substantial Completion of all the Work, Owner may use or occupy any substantially completed part of the Work which has specifically been identified in the Contract Documents, or which Owner, Engineer, and Contractor agree constitutes a separately functioning and usable part of the Work that can be used by Owner for its intended purpose without significant interference with Contractor's performance of the remainder of the Work, subject to the following conditions:

1. Owner at any time may request Contractor in writing to permit Owner to use or occupy any such part of the Work which Owner believes to be ready for its intended use and substantially complete. If and when Contractor agrees that such part of the Work is substantially complete, Contractor, Owner, and Engineer will follow the procedures of Paragraph 14.04.A through D for that part of the Work.

2. Contractor at any time may notify Owner and Engineer in writing that Contractor considers any such part of the Work ready for its intended use and substantially complete and request Engineer to issue a certificate of Substantial Completion for that part of the Work.

3. Within a reasonable time after either such request, Owner, Contractor, and Engineer shall make an inspection of that part of the Work to determine its status of completion. If Engineer does not consider that part of the Work to be substantially complete, Engineer will notify Owner and Contractor in writing giving the reasons therefor. If Engineer considers that part of the Work to be substantially complete, the provisions of Paragraph 14.04 will apply with respect to certification of Substantial Completion of that part of the Work and the division of responsibility in respect thereof and access thereto.

4. No use or occupancy or separate operation of part of the Work may occur prior to compliance with the requirements of Paragraph 5.10 regarding property insurance.

14.06 *Final Inspection*

A. Upon written notice from Contractor that the entire Work or an agreed portion thereof is complete, Engineer will promptly make a final inspection with Owner and Contractor and will notify Contractor in writing of all particulars in which this inspection reveals that the Work is incomplete or defective. Contractor shall immediately take such measures as are necessary to complete such Work or remedy such deficiencies.

14.07 *Final Payment*

A. *Application for Payment:*

1. After Contractor has, in the opinion of Engineer, satisfactorily completed all corrections identified during the final inspection and has delivered, in accordance with the Contract Documents, all maintenance and operating instructions, schedules, guarantees, bonds, certificates or other evidence of insurance, certificates of inspection, marked-up record documents (as provided in Paragraph 6.12), and other documents, Contractor may make application for final payment following the procedure for progress payments.

2. The final Application for Payment shall be accompanied (except as previously delivered) by:

   a. all documentation called for in the Contract Documents, including but not limited to the evidence of insurance required by Paragraph 5.04.B.6;

   b. consent of the surety, if any, to final payment;

   c. a list of all Claims against Owner that Contractor believes are unsettled; and

   d. complete and legally effective releases or waivers (satisfactory to Owner) of all Lien rights arising out of or Liens filed in connection with the Work.

3. In lieu of the releases or waivers of Liens specified in Paragraph 14.07.A.2 and as approved by Owner, Contractor may furnish receipts or releases in full and an affidavit of Contractor that: (i) the releases and receipts include all labor, services, material, and equipment for which a Lien could be filed; and (ii) all payrolls, material and equipment bills, and other indebtedness connected with the Work for which Owner might in any way be responsible, or which might in any way result in liens or other burdens on Owner's property, have been paid or otherwise satisfied. If any Subcontractor or Supplier fails to furnish such a release or receipt in full, Contractor may furnish a bond or other collateral satisfactory to Owner to indemnify Owner against any Lien.

B. *Engineer's Review of Application and Acceptance:*

1. If, on the basis of Engineer's observation of the Work during construction and final inspection, and Engineer's review of the final Application for Payment and accompanying documentation as required by the Contract Documents, Engineer is satisfied that the Work has been completed and Contractor's other obligations under the Contract Documents have been fulfilled, Engineer will, within ten days after receipt of the final Application for Payment, indicate in writing Engineer's recommendation of payment and present the Application for Payment to Owner for payment. At the same time Engineer will also give written notice to Owner and Contractor that the Work is acceptable subject to the provisions of Paragraph 14.09. Otherwise, Engineer will return the Application for Payment to Contractor, indicating in writing the reasons for refusing to recommend final payment, in which case Contractor shall make the necessary corrections and resubmit the Application for Payment.

C. *Payment Becomes Due:*

1. Thirty days after the presentation to Owner of the Application for Payment and accompanying documentation, the amount recommended by Engineer, less any sum Owner is entitled to set off against Engineer's

recommendation, including but not limited to liquidated damages, will become due and will be paid by Owner to Contractor.

14.08 *Final Completion Delayed*

A. If, through no fault of Contractor, final completion of the Work is significantly delayed, and if Engineer so confirms, Owner shall, upon receipt of Contractor's final Application for Payment (for Work fully completed and accepted) and recommendation of Engineer, and without terminating the Contract, make payment of the balance due for that portion of the Work fully completed and accepted. If the remaining balance to be held by Owner for Work not fully completed or corrected is less than the retainage stipulated in the Agreement, and if bonds have been furnished as required in Paragraph 5.01, the written consent of the surety to the payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by Contractor to Engineer with the Application for such payment. Such payment shall be made under the terms and conditions governing final payment, except that it shall not constitute a waiver of Claims.

14.09 *Waiver of Claims*

A. The making and acceptance of final payment will constitute:

1. a waiver of all Claims by Owner against Contractor, except Claims arising from unsettled Liens, from defective Work appearing after final inspection pursuant to Paragraph 14.06, from failure to comply with the Contract Documents or the terms of any special guarantees specified therein, or from Contractor's continuing obligations under the Contract Documents; and

2. a waiver of all Claims by Contractor against Owner other than those previously made in accordance with the requirements herein and expressly acknowledged by Owner in writing as still unsettled.

ARTICLE 15 – SUSPENSION OF WORK AND TERMINATION

15.01 *Owner May Suspend Work*

A. At any time and without cause, Owner may suspend the Work or any portion thereof for a period of not more than 90 consecutive days by notice in writing to Contractor and Engineer which will fix the date on which Work will be resumed. Contractor shall resume the Work on the date so fixed. Contractor shall be granted an adjustment in the Contract Price or an extension of the Contract Times, or both, directly attributable to any such suspension if Contractor makes a Claim therefor as provided in Paragraph 10.05.

15.02 *Owner May Terminate for Cause*

A. The occurrence of any one or more of the following events will justify termination for cause:

1. Contractor's persistent failure to perform the Work in accordance with the Contract Documents (including, but not limited to, failure to supply sufficient skilled workers or suitable materials or equipment or failure to adhere to the Progress Schedule established under Paragraph 2.07 as adjusted from time to time pursuant to Paragraph 6.04);

2. Contractor's disregard of Laws or Regulations of any public body having jurisdiction;

3. Contractor's repeated disregard of the authority of Engineer; or

4. Contractor's violation in any substantial way of any provisions of the Contract Documents.

B. If one or more of the events identified in Paragraph 15.02.A occur, Owner may, after giving Contractor (and surety) seven days written notice of its intent to terminate the services of Contractor:

1. exclude Contractor from the Site, and take possession of the Work and of all Contractor's tools, appliances, construction equipment, and machinery at the Site, and use the same to the full extent they could be used by Contractor (without liability to Contractor for trespass or conversion);

2. incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere; and

3. complete the Work as Owner may deem expedient.

C. If Owner proceeds as provided in Paragraph 15.02.B, Contractor shall not be entitled to receive any further payment until the Work is completed. If the unpaid balance of the Contract Price exceeds all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by Owner arising out of or relating to completing the Work, such excess will be paid to Contractor. If such claims, costs, losses, and damages exceed such unpaid balance, Contractor shall pay the difference to Owner. Such claims, costs, losses, and damages incurred by Owner will be reviewed by Engineer as to their reasonableness and, when so approved by Engineer, incorporated in a Change Order. When exercising any rights or remedies under this Paragraph, Owner shall not be required to obtain the lowest price for the Work performed.

D. Notwithstanding Paragraphs 15.02.B and 15.02.C, Contractor's services will not be terminated if Contractor begins within seven days of receipt of notice of intent to terminate to correct its failure to perform and proceeds diligently to cure such failure within no more than 30 days of receipt of said notice.

E. Where Contractor's services have been so terminated by Owner, the termination will not affect any rights or remedies of Owner against Contractor then existing or which may thereafter accrue. Any retention or payment of moneys due Contractor by Owner will not release Contractor from liability.

F. If and to the extent that Contractor has provided a performance bond under the provisions of Paragraph 5.01.A, the termination procedures of that bond shall supersede the provisions of Paragraphs 15.02.B and 15.02.C.

15.03 *Owner May Terminate For Convenience*

A. Upon seven days written notice to Contractor and Engineer, Owner may, without cause and without prejudice to any other right or remedy of Owner, terminate the Contract. In such case, Contractor shall be paid for (without duplication of any items):

1. completed and acceptable Work executed in accordance with the Contract Documents prior to the effective date of termination, including fair and reasonable sums for overhead and profit on such Work;

2. expenses sustained prior to the effective date of termination in performing services and furnishing labor, materials, or equipment as required by the Contract Documents in connection with uncompleted Work, plus fair and reasonable sums for overhead and profit on such expenses;

3. all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) incurred in settlement of terminated contracts with Subcontractors, Suppliers, and others; and

4. reasonable expenses directly attributable to termination.

B. Contractor shall not be paid on account of loss of anticipated profits or revenue or other economic loss arising out of or resulting from such termination.

15.04 *Contractor May Stop Work or Terminate*

A. If, through no act or fault of Contractor, (i) the Work is suspended for more than 90 consecutive days by Owner or under an order of court or other public authority, or (ii) Engineer fails to act on any Application for Payment within

30 days after it is submitted, or (iii) Owner fails for 30 days to pay Contractor any sum finally determined to be due, then Contractor may, upon seven days written notice to Owner and Engineer, and provided Owner or Engineer do not remedy such suspension or failure within that time, terminate the Contract and recover from Owner payment on the same terms as provided in Paragraph 15.03.

B. In lieu of terminating the Contract and without prejudice to any other right or remedy, if Engineer has failed to act on an Application for Payment within 30 days after it is submitted, or Owner has failed for 30 days to pay Contractor any sum finally determined to be due, Contractor may, seven days after written notice to Owner and Engineer, stop the Work until payment is made of all such amounts due Contractor, including interest thereon. The provisions of this Paragraph 15.04 are not intended to preclude Contractor from making a Claim under Paragraph 10.05 for an adjustment in Contract Price or Contract Times or otherwise for expenses or damage directly attributable to Contractor's stopping the Work as permitted by this Paragraph.

ARTICLE 16 – DISPUTE RESOLUTION

16.01 *Methods and Procedures*

A. Either Owner or Contractor may request mediation of any Claim submitted to Engineer for a decision under Paragraph 10.05 before such decision becomes final and binding. The mediation will be governed by the Construction Industry Mediation Rules of the American Arbitration Association in effect as of the Effective Date of the Agreement. The request for mediation shall be submitted in writing to the American Arbitration Association and the other party to the Contract. Timely submission of the request shall stay the effect of Paragraph 10.05.E.

B. Owner and Contractor shall participate in the mediation process in good faith. The process shall be concluded within 60 days of filing of the request. The date of termination of the mediation shall be determined by application of the mediation rules referenced above.

C. If the Claim is not resolved by mediation, Engineer's action under Paragraph 10.05.C or a denial pursuant to Paragraphs 10.05.C.3 or 10.05.D shall become final and binding 30 days after termination of the mediation unless, within that time period, Owner or Contractor:

1. elects in writing to invoke any dispute resolution process provided for in the Supplementary Conditions; or

2. agrees with the other party to submit the Claim to another dispute resolution process; or

3. gives written notice to the other party of the intent to submit the Claim to a court of competent jurisdiction.

ARTICLE 17 – MISCELLANEOUS

17.01 *Giving Notice*

A. Whenever any provision of the Contract Documents requires the giving of written notice, it will be deemed to have been validly given if:

1. delivered in person to the individual or to a member of the firm or to an officer of the corporation for whom it is intended; or

2. delivered at or sent by registered or certified mail, postage prepaid, to the last business address known to the giver of the notice.

17.02 *Computation of Times*

A. When any period of time is referred to in the Contract Documents by days, it will be computed to exclude the first and include the last day of such period. If the last day of any such period falls on a Saturday or Sunday or on a day made a legal holiday by the law of the applicable jurisdiction, such day will be omitted from the computation.

17.03 *Cumulative Remedies*

A. The duties and obligations imposed by these General Conditions and the rights and remedies available hereunder to the parties hereto are in addition to, and are not to be construed in any way as a limitation of, any rights and remedies available to any or all of them which are otherwise imposed or available by Laws or Regulations, by special warranty or guarantee, or by other provisions of the Contract Documents. The provisions of this Paragraph will be as effective as if repeated specifically in the Contract Documents in connection with each particular duty, obligation, right, and remedy to which they apply.

17.04 *Survival of Obligations*

A. All representations, indemnifications, warranties, and guarantees made in, required by, or given in accordance with the Contract Documents, as well as all continuing obligations indicated in the Contract Documents, will survive final payment, completion, and acceptance of the Work or termination or completion of the Contract or termination of the services of Contractor.

17.05 *Controlling Law*

A. This Contract is to be governed by the law of the state in which the Project is located.

17.06 *Headings*

A. Article and paragraph headings are inserted for convenience only and do not constitute parts of these General Conditions.

VII. SUPPLEMENTARY CONDITIONS

These Supplementary Conditions amend or supplement the Standard General Conditions of the Construction Contract (No. C-700, 2007 Edition) and other provisions of the Contract Documents as indicated below. All provisions that are not so amended or supplemented remain in full force and effect.

The terms used in these Supplementary Conditions will have the meanings indicated in the General Conditions. Additional terms used in these Supplementary Conditions have the meanings stated below, which are applicable to both the singular and plural thereof.

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SC-1.01.A.3. Add the following language to the end of Paragraph 1.01.A.3:

The Application for Payment form to be used on this Project is EJCDC No. C-620 or AIA Document G720. The Owner must approve all Applications for Payment before payment is made.

SC-1.01.A.9. Add the following language to the end of Paragraph 1.01.A.9:

The Change Order form to be used on this Project is EJCDC No. C-941 or a form provided by or otherwise acceptable to the Owner. Owner's approval is required before Change Orders are effective.

SC-2.03.A. Delete Paragraphs 2.03.A in its entirety and insert the following:

A. The Contract Times will commence to run on the thirtieth day after the Effective Date of the Agreement or, if a Notice to Proceed is given, on the day indicated in the Notice to Proceed. A Notice to Proceed may be given at any time within 30 days after the Effective Date of the Agreement.

SC-4.07. Add the following new section immediate after Paragraph 4.06.I:

4.07 *Archeological Finds / Significantly Important Archeological Resources*

A. For the Contractor's information, the Engineers have no information suggesting that the Project sites are of archeological significance.

B. Should the Contractor or Engineer discover evidence of remains, such as stone masonry building foundations, bones or other items of archaeological significance, Contractor shall report these findings to 1. Owner, 2. Local Historical Society, 3. State Historic Preservation Office (860) 256-2761, and 4. Resident Engineer or Inspector, and shall exercise the utmost care to ensure that these areas remain undisturbed. Contractor shall allow recovery of such finds by the authorities, shall not remove such artifacts under penalty of law, and shall prevent constriction or private vehicles from crossing over these areas. In addition, when directed by the Engineer, cover these areas with 1-ft common fill to the limits directed by the Engineer. Be advised that graves and any associated human remains are protected by Connecticut State law (C.G.S. Section 10-388 and 10-390). Any possible human skeletal remains must be reported to the State Archaeologist (860) 486-5248 and the State's Chief Medical Examiner (860) 679-3980 immediately upon discovery. If the State Archaeologist is unavailable, please contact the State Historic Preservation Office at the number above for immediate assistance.

SC-5.01. Add the following new paragraph immediately after Paragraph 5.01.C:

D. 100% Performance and 100% Payment bonds are required of the successful bidder. This bond shall cover all aspects of the specification and shall be delivered to the Purchasing Agent prior to the issuance of a purchase order. Bonds must meet the following requirements: Corporation - must be signed by an official of the corporation above their official title and the corporate seal must be affixed over the signature; Firm or Partnership - must be signed by all the partners and indicate they are "doing business as"; Individual - must be signed by the owner and indicated as "Owner". The surety company executing the bond or countersigning must be licensed in Connecticut and an official of the surety company must sign the bond with the corporate seal affixed over their signature. Signatures of two witnesses for both the principal and the surety must appear on the bond. Power of attorney for the official signing the bond for the surety company must be submitted with the bond. The Performance and Payment Bonds will be returned upon completion and acceptance of the job.

SC-5.04. Add the following new paragraph immediately after Paragraph 5.04.B:

C. Contractor/Vendor will agree to maintain in force at all times during which work/services are to be performed in accordance with the requirements of the "Insurance Requirements" section of this Project Manual.

SC-6.05.C. Amend the paragraph by making two subparagraphs under the title C. Engineer's Evaluation. The paragraph text is retitled, 6.05.C.2 After Effective Date of Agreement. A new paragraph is added before this paragraph to read as follows:

1. During Bidding. The Contract, if awarded, will be on the basis of materials and equipment specified or described in the Bidding Documents, or "or-equal" materials and equipment as defined in paragraph 6.05 of the General Conditions, or those substitute materials and equipment approved by the Engineer and identified by Addendum. The materials and equipment described in the Bidding Documents establish a standard of required type, function, and quality to be met by any proposed substitute or "or-equal" item. Request for Engineer's clarification of materials and equipment considered "or-equal" prior to the Effective Date of the Agreement must be received by the Engineer at least 5 days prior to the date for receipt of Bids. No item of material or equipment will be considered by Engineer as a substitute unless written request for approval has been submitted by Bidder and has been received by Engineer at least 15 days prior to the date for receipt of Bids. Each request shall conform to the requirements of Paragraph 6.05 of the General Conditions. The burden of proof of the merit of the proposed item is upon the Bidder. Engineer's decision of approval or disapproval of a proposed item will be final. If Engineer approves any proposed substitute item, such approval will be set forth in an Addendum issued to all prospective Bidders. Bidders shall not rely upon approvals made in any other manner.

SC-6.06. Add a new paragraph immediately after Paragraph 6.06.G:

6.06.H: The Contractor shall not award work valued at more than fifty (50%) percent of the Contract Price to Subcontractor(s), without prior written approval of the Owner.

6.06.I: The apparent low bidder (within 5 days of the bid opening) shall submit to the Owner a list of all proposed subcontractors. Subcontractors shall be submitted by the low bidder and evaluated by the Owner in accordance with article 12 of the Instructions to Bidders.

SC-6.08. Add a new paragraph immediately after Paragraph 6.08.A:

B. The Contractor shall be responsible for acquiring a building permit for the construction of the building. Town building permit fees will be waived, however the State of Connecticut fees of $0.26 per $1,000 of construction value must be paid at the time of building permit issuance. The Contractor shall be responsible for the fees associated with the acquisition of the building permit.

SC-6.10. Add a new paragraph immediately after Paragraph 6.10.A:

B. Owner is exempt from payment of sales and compensating use taxes of the State of Connecticut and of cities and counties thereof on all materials to be incorporated into the Work.

1. Owner will furnish the required certificates of tax exemption to Contractor for use in the purchase of supplies and materials to be incorporated into the Work.

2. Owner's exemption does not apply to construction tools, machinery, equipment, or other property purchased by or leased by Contractor, or to supplies or materials not incorporated into the Work.

SC-6.11.B. Add the following language at the end of paragraph 6.11.B:

The materials or refuse or other debris used in the construction of the work, shall be legally disposed away from the site in such manner so that will not endanger or interfere with persons or the work being performed.

SC-6.11.C. Delete Paragraphs 6.11.C in its entirety and insert the following:

C. *Cleaning:*

1. The Contractor shall exercise every precaution and means to prevent and control dust arising out of all construction operations from becoming a nuisance to abutting property owners or surrounding neighborhoods. Pavements adjoining the pipe trench shall be

kept broomed off and washed clean of excess materials wherever and whenever directed. Repeated daily dust control treatment shall be provided to satisfactorily prevent the spread of dust until permanent pavement repairs are made and until earth stockpiles have been removed, and all construction operations that might cause dust have been completed. No extra payment will be made for dust control measures, compensation shall be considered to be included in the prices stipulated for the appropriate items as listed in the bid.

2. In case the Contractor fails or neglects to promptly remove all surplus materials, tools, and incidentals after backfilling, leaving the street or surrounding area clean and free of debris, and do the required repaving when ordered, the Owner may, after 24 hours notice, cause the work to be done and the cost thereof deducted from any payment due to the Contractor.

3. After the work is completed, the pipes, manholes, and structures shall be carefully cleaned free of debris and dirt, broken masonry, and mortar, and left in first class condition, ready to use. All temporary or excess materials shall be disposed of off-site and the work left broom clean, to the satisfaction of the Owner.

4. Prior to Substantial Completion of the Work Contractor shall clean the Site and the Work and make it ready for utilization by Owner. At the completion of the Work Contractor shall remove from the Site all tools, appliances, construction equipment and machinery, and surplus materials and shall restore to original condition all property not designated for alteration by the Contract Documents.

SC-6.16. Add a new paragraph immediately after Paragraph 6.16.A:

B. The Contractor is required to provide the Owner with a telephone number which can be used during emergencies, 24 hours per day, seven days per week, to reach the Contractor.

SC-6.17. Add a new paragraph immediately after Paragraph 6.17.C.3:

4. Shop Drawings and submittals approved by the design professional shall be filed with the Building Official and Fire Marshal for Approval.

SC-10.01. Add a new paragraph immediately after Paragraph 10.01.B:

C. Enforcement of the State Building and Fire Codes by the Local Building Official and Fire Marshal are not grounds for a Change Order, as they are not actions by the Owner. It is the design professional and Contractors' respective responsibility to comply with the Connecticut State Building and Fire Codes.

SC-13.02. Add a new paragraph immediately after Paragraph 13.02.A:

B. The Contractor shall allow access to the site and project records by the Connecticut Department of Energy and Environmental Protection (DEEP) and/or authorized Federal and State representatives.

SC-14.02.A.3. Delete paragraph 14.02.A.3 in its entirety and insert the following:

3. The amount of retainage with respect to progress payments will be as stipulated in the Instructions to Bidders. No payments will be made that would deplete the retainage, place in escrow any funds that are required for retainage, or invest the retainage for the benefit of the Contractor.

SC-14.02.A.4. Add the following new Paragraph after Paragraph 14.02.A.3:

4. The Application for Payment form to be used on this Project is EJCDC No. C-620 or AIA Document G720. The Owner must approve all Applications for Payment before payment is made.

SC-14.02.A.5. Add the following new Paragraph after Paragraph 14.02.A.4:

5. The Contractor and all Subcontractors must submit weekly Connecticut Certified Payroll Forms in accordance with the requirements set forth in " Prevailing Wage Requirements & Rates" with each Application for Payment. Applications for Payment will not be processed until all of the required signed certified payrolls forms from the Contractor and all Subcontractors have been submitted to the Owner.

SC-14.02.E. Add the following new Paragraph after Paragraph 14.02.D.3:

E. *CGS 49.41a - Enforcement of Payment by General Contractor to Subcontractor and Subcontractor to his Subcontractors*

a. The general contractor, within thirty days after payment to the contractor by the state or a municipality, shall pay any amounts due any subcontractor, whether for labor performed or materials furnished, when the labor or materials have been included in a requisition submitted by the contractor and paid by the state or a municipality; (2) each subcontractor shall pay any amounts due any of its subcontractors, whether for labor performed or materials furnished, within thirty days after such subcontractor receives a payment from the general contractor which encompasses labor or materials furnished by such subcontractor.

b. Each payment requisition submitted in accordance with the requirements of subsection (a) of this section, except for any such payment requisition submitted pursuant to a contract administered by or in conjunction with the Department of Transportation, shall

include a statement showing the status of all pending construction change orders, other pending change directives and approved changes to the original contract or subcontract. Such statement shall identify the pending construction change orders and other pending change directives, and shall include the date such change orders and directives were initiated, the costs associated with their performance and a description of any work completed. As used in this section, "pending construction change order" or "other pending change directive" means an authorized directive for extra work that has been issued to a contractor or a subcontractor.

c. If payment is not made by the general contractor or any of its subcontractors in accordance with such requirements, the subcontractor shall set forth his claim against the general contractor and the subcontractor of a subcontractor shall set forth its claim against the subcontractor through notice by registered or certified mail. Ten days after the receipt of that notice, the general contractor shall be liable to its subcontractor, and the subcontractor shall be liable to its subcontractor, for interest on the amount due and owing at the rate of one per cent per month. In addition, the general contractor, upon written demand of its subcontractor, or the subcontractor, upon written demand of its subcontractor, shall be required to place funds in the amount of the claim, plus interest of one per cent, in an interest-bearing escrow account in a bank in this state, provided the general contractor or subcontractor may refuse to place the funds in escrow on the grounds that the subcontractor has not substantially performed the work according to the terms of his or its employment. In the event that such general contractor or subcontractor refuses to place such funds in escrow, and the party making a claim against it under this section is found to have substantially performed its work in accordance with the terms of its employment in any arbitration or litigation to determine the validity of such claim, then such general contractor or subcontractor shall pay the attorney's fees of such party.

d. No payment may be withheld from a subcontractor for work performed because of a dispute between the general contractor and another contractor or subcontractor.

e. This section shall not be construed to prohibit progress payments prior to final payment of the contract and is applicable to all subcontractors for material or labor whether they have contracted directly with the general contractor or with some other subcontractor on the work.

SC-15.02.B. Delete the word “seven” from the second line and insert the word “ten” in its place.

SC-17.05 Add a new paragraph immediately after Paragraph 17.05.A:

B. Contractors shall observe and comply with all Federal, State and local laws, ordinances and regulations. Contractors shall indemnify and save harmless the Town, all of its officers, agents and servants against any claim or liability arising from or based on the

violation of any such law, ordinance, regulation or negligence whether by the bidder, his employees, his consultant and/or their employees.

SC-18 Add a new Article 18, "STREET AND SIDEWALK ACCESS," after Article 17.

18.01 *Streets and Sidewalks to be Kept Open*

A. The Contractor shall at all times keep the streets and highways in which he may be working open for pedestrian and vehicular traffic. If in the opinion of the Owner, the interest of abutters and the public requires it, the Contractor shall bridge or construct planking across trenches at street crossings and roads or private ways. The Contractor shall conduct his work in such a manner as the Owner may direct from time to time. No sidewalk shall be obstructed where it is possible to avoid it.

B. As required or directed by the Owner, the Contractor shall install in selected locations suitable plank crossings, substantially built and reinforced to sustain vehicular traffic across excavations. No separate payment will be made for this work, the cost of which shall be included in the prices stipulated for the appropriate items in the work as listed in the bid.

18.02 *Emergency Access*

A. The Contractor shall provide all necessary emergency vehicle crossings at principal intersections or ways usually traveled by emergency apparatus with provisions for the apparatus so it can travel along the line of the pipe installations.

B. If it becomes necessary at any time to temporarily barricade a street or cause detours to be put up, or rerouting of traffic, the Fire and Police Departments, Board of Education, and ambulance company shall be notified by the Contractor, and their consent obtained before any such action is initiated.

18.03 *Bus Line Interference*

A. Whenever it may be necessary to interfere with any bus lines, notice shall be given to the corporation owning the same, and reasonable time will be given to said corporation to arrange the schedule for operation of the bus line, as it may be necessary.

SC-19 Add a new Article 19, "TEMPORARY POWER," after Article 18.

19.01 The Contractor shall make all the necessary arrangements with the power company for providing temporary electric power for his use. All unauthorized sources of power, such as from neighboring homes, shall be prohibited.

SC-20 Add a new Article 20, "BLASTING," after Article 19.

20.01 *Approvals*

A. The approval of the Owner shall first be obtained before blasting is permitted. Before any explosive, such as dynamite or detonator caps are stored or used, the Contractor shall contact the Fire Department of the Town of Montville for instructions relative to the regulations for possession and use of explosives in the Town of Montville, Connecticut. The Contractor shall obtain all required permits, or licenses for possession and use of explosives to be used on the site or sites of construction.

20.02 *Requirements*

A. The Contractor shall also be responsible for the explosive materials at all times; for the keeping of records regarding the explosives open at all times to inspection by the Police and Fire Departments of the Town of Montville, Connecticut; for the storage of explosive materials in a secure manner away from all tools, overnight or for any length of time at the site or sites of construction; for the keeping of only such quantity of explosive material as may be needed for the work underway; for the immediate reporting to the Police and Fire Departments of the Town of montville, Connecticut of all unaccounted for explosive materials; for completely, adequately and carefully covering all blasts with suitable blasting mats in such a manner to prevent damage to landscape features, structures, facilities, privately owned and all other properties and surrounding objects and in a manner that will prevent injury to persons.

B. Unless specifically permitted, no blasting shall be done between the hours of sunset and sunrise on any day and no blasting will be allowed on Sundays or legal holidays.

C. Receptacles especially constructed for use in the storage of explosives shall be provided for the storage of explosives and they shall be proof against bullets, fire or other conditions which might cause explosions of the contents. When the need for explosives is ended, all such materials remaining on the job shall be promptly removed from the premises.

SC-21 Add a new Article 21, "CONTRACTOR TO CHECK DIMENSIONS AND SCHEDULES," after Article 20.

21.01 The Contractor will be required to check all dimensions and quantities shown on the drawings or schedules given to him by the Owner, and shall notify the Owner of all errors therein which he may discover by examining and checking the same. The Contractor shall not take advantage of any error or omissions in these specifications, drawings, or schedules. The Owner will furnish all instructions should such error or omissions be discovered, and the Contractor shall carry out such instructions as if originally specified.

SC-22 Add a new Article 22, "PROTECTION OF TREES," after Article 21.

22.01 The Contractor shall take special care to preserve and protect from injury all trees located along the lines of construction, and no such trees shall be cut down, trimmed, or otherwise cut unless called for on the Plans or without permission from the Owner.

SC-23 Add a new Article 23, "LIGHTS, BARRIERS, WATCHMEN AND INDEMNITY," after Article 22.

A The Contractor shall erect and maintain such barriers, lighting, warning lights, danger warning signals, and signs that will prevent accidents during the construction work and protect the work and insure the safety of personnel and the public at all times and places; the Contractor shall indemnify and protect the Owner and the Engineer in every respect from injury or damage whatsoever caused by any act of neglect by the contractor or his subcontractors, or their servants or agents, including any claims arising out of failure to erect and maintain sufficient railing or fence as required by Section 13A-111 Connecticut General Statutes from claims or defect in violation of 12A-14q Connecticut General Statutes.

B The fact that the Department of Public Works may retain control of the premises, or that it or its agents may take action to erect or maintain railings or fences shall not relieve the Contractor's obligations hereunder.

C In addition to the above, when and as necessary, or when required by the Owner, the Contractor shall post sign and employ watchmen or flagmen for the direction of traffic at the site and for excluding at all times unauthorized persons from the work site.

D The Contractor shall be responsible for excluding at all times from the land within the easement areas, all persons not directly connected with the work.

SC-24 Add a new Article 24, "NIGHTWORK," after Article 23.

A Nightwork, or work on Saturdays, Sundays, or legal holidays requiring the presence of an engineer or inspector, will not be permitted except as designated by the Owner in case of an emergency. Should it be necessary for the Owner to operate an organization for continuous nightwork or for emergency nightwork, the lighting, safety and other facilities which are deemed necessary shall be provided by the Contractor. Compensation for this work shall be considered as having been included in the prices stipulated for the appropriate items of work as listed in the bid, and no extra compensation will be paid by the Owner.

SC-25 Add a new Article 25, "TRAFFIC CONTROL," after Article 24.

A. The Contractor shall schedule and perform his work so as to cause minimum interference to traffic and to safeguard all highways and traffic therein, and to cause absolutely no interference to fire and emergency vehicles. Construction equipment and materials shall be located as to not endanger the work or obstruct traffic.

B. Every reasonable means shall be made to reduce, to a minimum, interference with and inconvenience to business concerns on account of the construction work.

C. The Contractor shall provide and maintain all signs, barricades, and traffic control equipment that may be required for the satisfactory performance of providing traffic control.

SC-26 Add a new Article 26, "LENGTH OF TRENCH TO BE OPENED," after Article 25.

A. The length of trench opened at any time from the point where ground is being broken to complete backfill and also the amount of space in the streets or public and private lands occupied by equipment or supplies, shall not exceed the length or space considered reasonably necessary and expedient by the Owner. In determining the length of the open trench or spaces for equipment, material, and supplies and other necessities, the Owner will consider the nature of the lands or streets where work is being done, types and methods of construction and equipment being used, inconvenience to the public or to private parties, possible dangers and other matters. All work must be constructed with a minimum of inconvenience and danger to all parties concerned.

B. Whenever the trench obstructs pedestrians and vehicular traffic, or any public or private property, the Contractor shall take such means as is necessary to maintain such traffic and access. Until such time as the work may have attained sufficient strength to support backfill, or if for any reason it is not expedient to backfill the trench immediately, the Contractor shall construct and maintain suitable plank crossings and bridge crossings to carry essential traffic in or to the street or property in question, as specified or directed.

C. Suitable lights, signs, and such required items to direct traffic shall be furnished and maintained by the Contractor.

D. The Contractor shall keep streets free from obstructions, debris, and all other materials. The Owner may, at any time, order the removal of any such material from the work area - and should the Contractor fail to do so within 24 hours after such notice of removal of the same, the Owner may cause the material, debris, or other matter to be removed by some other such persons as he may employ, at the Contractor's expense. The cost thereof may be deducted from any payments due the Contractor under this contract. In special cases where public safety demands, the Owner may remove such materials without prior notice.

SC-27 Add a new Article 27, "CONTRACTOR TO LAYOUT WORK," after Article 26.

A. The Owner will establish such general reference points as in his judgment will enable the Contractor to proceed with the work. The Contractor, at his own expense, shall provide all materials and equipment and such qualified helpers as the Owner may require for setting

the general reference points and shall protect and preserve all stakes, benches, and other markers used to identify the reference points. The Contractor shall lay out all the Contract work from the above and shall be responsible for the accuracy of all lines, grades, and measurements. He will be required to employ at no extra expense to the Owner, a Connecticut registered land surveyor or registered professional engineer who shall perform all layout work for the construction of the Contract work, including all lines, grades, and measurements.

SC-28 Add a new Article 28, "EXISTING UTILITIES OR CONNECTIONS," after Article 27.

A. The location of existing underground pipes, conduits, and structures as shown has been collected from the best available sources and the Owner together with his agents, does not imply or guarantee the data and information in connection with underground pipes, conduits, structures, and such other parts, as to their completeness, nor their locations as indicated. The contractor shall assume that there are existing water, gas, and other utility connections to each and every building en-route, whether they appear on the drawings or not. Any expense and/or delay occasioned by utilities and structures or damage thereto, including those not shown, shall be the responsibility of the Contractor, at no additional expense to the Owner.

B. Before proceeding with construction operations, the Contractor shall make such supplemental investigations, including exploratory excavations by hand digging, as he deems necessary to uncover and determine the exact locations of utilities and structures and shall have no claims for damages due to encountering subsurface structures or utilities in locations other than those shown on the drawings, or which are made known to the Contractor prior to construction operations. The Contractor shall be responsible and liable for all damages to existing utilities and structures.

SC-29 Add a new Article 29, "FIRE AND POLICE NOTIFICATION," after Article 28.

A. If it becomes necessary at any time to temporarily barricade a street or cause detours to be put up, or rerouting of traffic, the Fire and Police Departments, SEAT, Board of Education, and American Ambulance shall be notified by the Contractor, and their consent obtained before any such action is initiated.

SC-30 Add a new Article 30, "CLEANING FINISHED WORK AND THE SITE," after Article 29.

A. After the work is completed, the pipes, manholes, and structures shall be carefully cleaned free of debris and dirt, broken masonry, and mortar, and left in first class condition, ready to use. All temporary or excess materials shall be disposed off-site and the work left broom clean, to the satisfaction of the Owner.

B. In completing his operations, the Contractor shall immediately remove all surplus material, tools, and other property belonging to him, leaving the entire street or surroundings free and clean and in good order, at no additional expense to the Owner. The Contractor shall exercise special care in keeping the rights-of-way and private lands upon which work is performed free and clean of all debris, and shall remove all tools and other property when they are not in use.

SC-31 Add a new Article 31, "LICENSING REQUIREMENTS," after Article 30.

31.01 The following are licensing requirements for the State of Connecticut to perform water installations and repairs:

A. All Electrical work shall be performed by the Connecticut licensed Electrician.

VIII. TECHNICAL SPECIFICATIONS

INDEX TO TECHNICAL SPECIFICATIONS

SECTION 01 00 00
GENERAL REQUIREMENTS

1.01 SUMMARY OF WORK

1.01.1 Description:

The work required under this contract generally includes but is not limited to the following:

1. Mobilizing to the site and providing provisions for maintenance and protection of vehicular and pedestrian traffic.
2. The design and construction of the building foundation including any geotechnical investigations as may be needed for the design.
3. The design and construction of a new metal building or post frame building for use as an equipment storage garage, meeting the specifications herein.
4. Site preparation including temporary construction fencing, removal of ground stumps, furnish and install erosion and sedimentation control measures, and provide stockpiling and staging areas as needed.
5. All site work as depicted on the Contract Drawings.
6. All surface restoration, including gravel surfacing and turf re-establishment.

The Contractor shall submit the building manufacturer information and proposed building design selection with the Bid Proposal.

The contractor shall purchase, provide, and install all materials (temporary and permanent) and equipment necessary to complete the work specified in Contract Documents.

The entire work provided for in these technical specifications and on the Drawings shall be constructed and finished in every respect in a good workmanlike and substantial manner. It is not intended that the Drawings shall show every detail piece of material or equipment, but such parts and pieces as may be in accordance with the best practices and regulatory requirements, even though not shown, shall be furnished and installed. All materials and equipment shall be new unless specifically stated otherwise in these Contract Documents.

1.01.2 Location of Site:

The work site for this contract is located at *Camp Oakdale – 176 Meeting House Lane, Oakdale, Connecticut 06382*, as shown on the Contract Drawings.

1.01.3 Work Sequence

Work shall be sequenced so as to allow for uninterrupted flow of existing utilities. The contractor shall conform to the sequences of work as outlined in the Construction Drawings and

Specifications. Variations or modifications to the work sequences shall be submitted in writing to the Engineer prior to construction, for their approval.

The contractor shall coordinate work with adjacent utility owners as outlined in the Construction Drawings and Specifications, where appropriate, or as required by the Owner.

All costs associated with sequencing of work and coordination shall be included in the bid prices for other items.

The Contractor shall submit a construction schedule and modify it from time to time as need arises. The Construction schedule shall be based on the specified completion time. The Construction Schedule shall show the order of work including such significant tasks as construction of lines, connections, backfill and compaction, leakage tests, temporary and permanent restoration. The Construction Schedule shall be submitted for the Owner's approval prior to start of Construction and updated at the time of submitting each request for progress payment.

All completed pipelines, mainlines, service connections, etc. shall be tested as work progresses and in order to ensure this, the Contractor shall arrange for testing equipment to be on site prior to the commencement of pipe laying.

1.01.4 Survey Assistance:

Furnish helpers on an as needed basis to assist the Engineer in checking work.

1.01.5 Project Coordination

The work included in these Contract Documents is to be performed under the responsibility of a single prime contract. The Contractor is responsible for the coordination of all the work, whether performed by its own personnel or its subcontractor, and will maintain such procedures as necessary to keep its workman and suppliers informed of project progress so as not to unnecessarily delay completion of the Work.

1.01.6 Standard Specifications

The Standard Specifications for Roads, Bridges, and Incidental Construction, Supplement Form 819, dated 2024 of the State of Connecticut, as specifically referenced to in the Technical Specifications, shall apply and be considered a part of this specification as though it were bound herein. The Standard Specification is available from:

https://portal.ct.gov/dot/knowledge-base/articles/form-819-specifications?language=en_US

SECTION 01 20 00
PRICE AND PAYMENT PROCEDURES

1.0 DESCRIPTION

The following section describes how the work is measured and paid for each item in the Bid Form. Each unit or lump sum price stated in the Bid Form shall constitute full compensation as specified herein for each item of work completed in accordance with the contract Drawings and Specifications.

All costs or expenses for work not measured or paid for separately shall be included in these bid items.

1. Mobilization:
   This work shall be measured and paid for as a lump sum for "Mobilization" and shall include all fees, materials, equipment, tools, and labor incidental to the completion of this item.

2. Provisional Item – Rock Excavation & Disposal:
   Where rock is encountered, it shall be uncovered but not excavated until measurements have been made by the Engineer, unless in the opinion of the Owner satisfactory measurements can be made in some other manner.

   Rock excavation and disposal will be measured in cubic yards in its original position, prior to excavation, computed to a depth of twelve inches below the new pipe, new conduit, or new structure or as directed in writing by the Owner. If rock excavation is directed to be performed to less than the payment width and/or depth indicated, the Contractor will be paid only for the actual quantity of rock so directed. The measurement will not include unauthorized excavations.

   Boulders or detached rock fragments which are 1 cubic yard or more in volume will be measured individually, and the volume computed from the average dimensions taken in three representative directions.

   Measurement of rock excavation for purposes of payment shall be as follows, regardless of the actual amount of rock removed.

   Rock excavation in trenches shall be measured to a width, according to the “trench width” designated on the Contract Drawings, centered on the pipe from the original surface of the rock to a plane one foot below the underside of the conduit/pipeline. If the rock does not extend the full width or depth of the trench, only the actual amount of rock removed within the described measurement lines shall be allowed.

In excavation for structures, rock excavation shall be measured as having sides located twelve (12) inches beyond the outside of the manhole structure to the original surface of the rock.

The unit prices for payment under this Section shall include full compensation for all labor, materials, tools and equipment required for rock excavation and placing of the excavated material in spoil banks or elsewhere offsite as required.

Payment for rock excavation shall be by the cubic yard, measured as described above.

This is a provisional item. Quantities for provisional items may or may not be used in whole or in part at the discretion of the Owner. This shall in no way affect the established contract unit price.

3. Site Work
This work shall be measured and paid for as a lump sum for "Site Work". Said price shall include installation and maintenance of erosions and sedimentation controls, site preparation, maintenance and protection of traffic, temporary fencing, construction stake-out and layout, stump removal and backfill, stripping and stockpiling of soils, trench excavation, general excavation, furnish and install fill as needed, modular concrete block retaining wall, grading, gravel surfacing, and all surface restoration as outlined on the site plan, and all work not specifically listed elsewhere.

4. Design-Build: Metal Equipment Storage Garage
This work shall be measured and paid for as a lump sum for "Design-Build: Metal Equipment Storage Garage". Said price shall include the design and installation of a metal building or post frame building system meeting the requirements of the technical specifications. Shall include extension of electrical branch circuits from the existing panel in the adjacent shed for emergency lighting and safety in accordance with the building code. Shall include all costs for design, fabrication, transportation, and installation of the metal building system and all work not specifically listed elsewhere.

The Contractor shall be responsible for acquiring a building permit for the construction of the building. Town building permit fees will be waived, however the State of Connecticut fees of $0.26 per $1,000 of construction value must be paid at the time of building permit issuance. The Contractor shall be responsible for the fees associated with the acquisition of the building permit.

Enforcement of the State Building and Fire Codes by the Local Building Official and Fire Marshal are not grounds for a Change Order, as they are not actions by the Owner. It is the design professional and Contractors' respective responsibility to comply with the Connecticut State Building and Fire Codes.

5. Design-Build: Metal Equipment Storage Garage Foundation
   This work shall be measured and paid for as a lump sum for "Design-Build: Metal Equipment Storage Garage Foundation". Said price shall include the design and installation of a foundation system for the metal building meeting the requirements of the technical specifications. Shall include all costs for design, fabrication, and installation of the foundation system and concrete floor, and all work not specifically listed elsewhere.

Add Alternate #1

1. Electrical Work – New Service:
   This work shall be measured and paid for as a lump sum for "Electrical Work – New Service". Said price shall include the services of a Connecticut Licensed Electrician. The new service shall include a new 200-amp electrical panel, conduit, handholes, caps, pull strings, trench excavation and backfill, and surface restoration. Electrical conduit shall be run from the existing handhole to the new service panel. The Town will coordinate with Eversource for the new service wiring from the handhole to the new panel.

Add Alternate #2

2. Electrical Work – Interior Receptacles:
   This work shall be measured and paid for as a lump sum for "Electrical Work – Interior Receptacles". Said price shall include the services of a Connecticut Licensed Electrician. Said price shall include surface mounted electrical outlets and metal conduit within the building. Shall include all mounting hardware, conduit, junction boxes, outlets & boxes, and all work necessary for a fully functioning electrical system.

Add Alternate #3

3. Electrical Work – Lighting:
   This work shall be measured and paid for as a lump sum for "Electrical Work – Lighting". Said price shall include the services of a Connecticut Licensed Electrician. Shall include interior ceiling mounted LED lighting. Shall include all mounting hardware, conduit, junction boxes, switches, motion sensors, and all work necessary for a fully functioning lighting system.

Add Alternate #4

4. Concrete Apron:
   This work shall be measured and paid for as a lump sum for "Concrete Apron". Shall include providing a concrete apron at the overhead doors. Shall include all excavation, backfill, formwork, concrete, reinforcing, and all work necessary of the concrete aprons.

Add Alternate #5

5. Overhead Door Openers:
   This work shall be measured and paid for as a lump sum for "Overhead Door Openers". Said price shall include providing automatic overhead door openers at each of the four garage

doors. Shall include all electrical wiring, conduit, mounting hardware, automatic openers, remote openers, and all other work as necessary for fully functioning automatic overhead door openers.

SECTION 01 71 13
MOBILIZATION

1.0 DESCRIPTION

This section shall consist of all work associated with the mobilization and demobilization of the contractor's forces and equipment necessary for performing the work required under the contract. It does not include mobilization and demobilization for specific items of work for which payment is provided elsewhere in the contract.

This section shall also include costs for required bonds, insurances and other incidental preconstruction items associated with the startup and completion of the work.

Mobilization shall include the following:

A. Costs for performance and payment bonds.
B. Costs for insurances.
C. Provide, maintain, and remove temporary sanitary facilities.
D. Establishing and removing temporary staging areas, lay down areas, and offices if needed.
E. Any and all startup costs, removal costs, transportations costs, or costs or fees associated with mobilizing equipment or personnel to the project site and off the project site at the completion of work.

SECTION 01 80 00
PERFORMANCE STANDARDS

1.0 DESCRIPTION

The proposed building, foundation, and site development shall meet the following performance requirements and standards.

The Contractor shall submit the building manufacturer information and proposed building design selection with the Bid Proposal.

1.1 BUILDING REQUIREMENTS

Building Classification:	S-1, dry storage, no active repair
Building Design:	The proposed building shall be a metal building system or a post frame building system.
Building Dimensions:	The building shall be 100’-0” long x 40’-0” wide with a tolerance of plus or minus 5’ in length and width. Building shall be clear span.
Building Wall Height:	Walls shall be a minimum of 14’-0” high.
Exterior Wall Material:	Roll formed steel with stainless steel fasteners
Exterior Wainscot:	3’-0” high roll formed steel with stainless steel fasteners
Interior Wall Material:	Roll formed steel with stainless steel fasteners, floor to ceiling
Ceiling Material:	Roll formed steel with stainless steel fasteners
Roof Pitch:	4V:12H
Roof Overhang:	Minimum 1’-0” overhang on all sides.
Wall Insulation:	R-30 rating minimum
Ceiling Insulation:	R-38 rating minimum
Gutters & Downspouts:	Minimum 0.030-gauge seamless aluminum gutters. Minimum 4”x5” 0.030-gauge downspouts.

Floor:	Reinforced concrete. Minimum floor thickness shall be 5".
Overhead Doors:	4 insulated overhead doors at 12'-0" high x 12'-0" wide minimum. Doors shall be located along the face of the building and shall be within 80' of the northeast corner of the building approximately as shown on the site plans.
Personnel Doors:	2 insulated personnel doors at 3'-0" wide x 6'-8" high. A personnel door shall be located at each gable end of the building approximately as shown on the site plan.
Electrical Service:	Base Bid: Provide two 20-amp branch circuits from the existing panel at the adjacent shed to the new building for emergency service lighting and service per the Building Code Add Alternate: Provide conduit, handholes, service entrance, and 200-amp panel for a new electrical service to the building. The Town will coordinate with Eversource for new service connection and wiring to the panel.
Interior Lighting:	Base Bid: Emergency lighting shall be provided in accordance with the Building Code. Add Alternate: Maximum 100w ceiling mounted LED fixtures, mounted 12' above the finished floor. The number of lights and locations shall be designed to provide 35 foot candles at the floor. The lighting system shall include a motion sensor.
Electrical Outlets:	Base Bid: Provide a single convenience receptacle near the branch circuit building entrance. Add Alternate: Electrical outlets shall be surface mounted with surface mounted conduit. Outlets shall be located at a maximum of 20' on center. An outlet shall be placed between each overhead door.

1.2 BUILDING DESIGN REQUIREMENTS

A. Governing Design Code:
   1. Structural design for the building structural system shall be provided by the building system manufacturer for the following design criteria:
      a. Governing Building Code 2022 State of Connecticut Building Code

b. Occupancy Category: S-1 – Dry Storage, No Active Repair

B. Roof Live Load:
1. Roof live loads are loads produced during the life of the structure by moveable objects.
2. Wind, snow, seismic, or dead loads are not live loads.
3. Roof live loads are applied based on the Tributary Area as stated in code.

C. Roof Snow Load:
1. Roof snow load used for designing the structure shall not be reduced and shall be the product of the
   a. Ground Snow Load (Pg): 30 psf
   b. Flat Roof Snow Load (Pf): 30 psf.
2. Design snow load shall include the effects of minimum flat roof load limits, rain on snow, drifting snow, and unbalanced snow load as defined in the governing building code specified above.

D. Wind Load:
1. Wind load used for designing the structure shall be the product of the following criteria:
   a. Basic Wind Speed (3 Sec): 130 MPH
   b. Risk Category: II
   c. Wind Exposure Category: C
   d. Wind Velocity Internal Pressure Exposure Coefficient (Kz): +/- 0.18
   e. Lateral Stiffness H/120 and or L/240 as appropriate
2. Wind Pressure Coefficients and the design pressures shall be applied in accordance with the governing code.

E. Seismic Load:
1. Seismic load used for designing the structure shall be based on the following criteria:
   a. Spectral response acceleration for short periods (Ss): 0.247% g.
   b. Spectral response acceleration for 1-sec. period (S1): 0.077% g.
   c. Site Class: B.
   d. Seismic Importance Factor (I): 1.0
2. Seismic loads shall be applied in accordance with the governing code.

F. Dead Load: Dead load shall consist of the weight of building system construction, such as roof, framing, and covering members.

G. Collateral Load:
1. Collateral load in pounds per square foot shall be applied to the entire structure

to account for the weight of additional permanent materials other than the building system, such as sprinklers, mechanical systems, electrical systems, hung partitions, and ceilings.

2. The only collateral loads to design for are the electrical and lighting systems.

H. Auxiliary Loads: None

I. DEFLECTIONS

1. System Requirements
   a. Roof and wall system shall be able to withstand the imposed loads with maximum allowable deflection in accordance with 2024 IBC.
   b. Assembly shall permit movement of components without buckling, failure of joint seals, undue stress on fasteners or other detrimental effects.
   c. Size and fabrication of roof and wall systems to be free of distortion or defects that would be detrimental to appearance or performance

2. Structural Members:
   a. Maximum deflection of main framing members shall not exceed L/360 of their respective spans.
   b. Maximum deflection due to snow load in roof panels and purlins shall not exceed L/240 of their respective spans.
   c. Maximum deflection due to wind load in wall panels and girts shall not exceed L/180 of their respective spans.

3. Lateral deflections, or drift, at the roof level of the structure in relation to the floor or slab on grade, caused by deflection of horizontal force resisting elements, shall not exceed H/120 OR L/240 as appropriate.

4. Calculations for deflections shall be done using only the bare frame method.
   a. Reductions based on engineering judgment using the assumed composite stiffness of the building envelope shall not be allowed.

1.3 DESIGN SUBMITTALS

A. The Contractor shall submit the building design plans, foundation design, and concrete floor design to the Director of Public Works at least two (2) weeks prior to submittal for building permits. The Director of Public works shall review and approved the designs prior to submittal for building permits.

B. Product Data: Submit the building system manufacturer's product information,

specifications, and installation instructions for building components and accessories.

C. Erection Drawings: Submit building system manufacturer's erection drawings, including plans, elevations, sections, and details, indicating roof framing, transverse cross-sections, covering and trim details, and accessory installation details to clearly indicate proper assembly of building components.

D. Certification: Submit written "Certificate of design and manufacturing conformance" prepared and signed by a Professional Engineer, registered to practice in Connecticut verifying that the building system design and metal roof system design (including panels, clips, and support system components) meet indicated loading requirements and codes of authorities having jurisdiction.
   1. Certification shall reference specific dead loads, live loads, snow loads, wind loads/speeds, tributary area load reductions (if applicable), concentrated loads, collateral loads, seismic loads, end-use categories, governing code bodies, including year, and load applications.

E. Submit certification verifying that the metal roof system has been tested and approved by Underwriter's Laboratory as Class 90.

F. Submit certification verifying that the metal standing seam roof system has been tested in accordance with ASTM E 1592 test protocols.

G. Dealer Certification: Submit certification that the building system supplier or metal roof system supplier is a manufacturer's authorized and franchised dealer of the system to be furnished.
   1. Certification shall state date on which authorization was granted.

H. Installer Certification: Submit certification that the building system or roof system installer has been regularly engaged in the installation of building systems of the same or equal construction to the specified system.

I. Building Warranty Documentation: Submit manufacturer's standard warranty.

J. The building foundation and reinforced concrete floor shall be designed by Connecticut Licensed Professional Engineer. The design of these items shall be submitted for review.

1.4 BUILDING PERMIT

A. The Contractor shall be responsible for submitting the building plans, foundation plans, floor design, and electrical system plans to the Town Building Official for review and issuance of a building permit prior to construction.

B. Enforcement of the State Building and Fire Codes by the Local Building Official and Fire Marshal are not grounds for a Change Order, as they are not actions by the Owner. It is the design professional and Contractors' respective responsibility to comply with the Connecticut State Building and Fire Codes.

C. Shop Drawings and submittals approved by the design professional shall be filed with the Building Official and Fire Marshal for Approval.

D. The Contractor shall be responsible for acquiring a building permit for the construction of the building. Town building permit fees will be waived, however the State of Connecticut fees of $0.26 per $1,000 of construction value must be paid at the time of building permit issuance. The Contractor shall be responsible for the fees associated with the acquisition of the building permit.

END OF SECTION 01 80 00

SECTION 03 30 00
CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes cast-in-place concrete, including formwork, reinforcement, concrete materials, mixture design, placement procedures, and finishes, for the following:
   1. Design & Build of the new building foundation: The Contractor shall design and build a foundation system in accordance with the building code for the proposed building system.
   2. Design & Build of the new concrete floor: The Contractor shall design a reinforced concrete floor capable of supporting the design loads. The minimum floor thickness shall be 5".

1.3 DEFINITIONS

A. Cementitious Materials: Portland cement alone or in combination with one or more of the following: blended hydraulic cement, fly ash and other pozzolans, ground granulated blast-furnace slag, and silica fume; subject to compliance with requirements.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.
B. Design Mixtures: For each concrete mixture. Submit alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.
   1. Indicate amounts of mixing water to be withheld for later addition at Project site.
C. Steel Reinforcement Shop Drawings: Placing drawings that detail fabrication, bending, and placement. Include bar sizes, lengths, material, grade, bar schedules, stirrup spacing, bent bar diagrams, bar arrangement, splices and laps, mechanical connections, tie spacing, hoop spacing, and supports for concrete reinforcement.
D. Construction Joint Layout: Indicate proposed construction joints required to construct the structure.
   1. Location of construction joints is subject to approval of the Architect and Engineer.
E. Samples: For vapor retarder.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer, manufacturer, & testing agency.
B. Material Certificates: For each of the following, signed by manufacturers:
   1. Cementitious materials.

2. Admixtures.
3. Form materials and form-release agents.
4. Steel reinforcement and accessories.
5. Fiber reinforcement.
6. Waterstops.
7. Curing compounds.
8. Floor and slab treatments.
9. Bonding agents.
10. Adhesives.
11. Vapor retarders.
12. Semirigid joint filler.
13. Joint-filler strips.
14. Repair materials.

C. Material Test Reports: For the following, from a qualified testing agency, indicating compliance with requirements:
   1. Aggregates. Include service record data indicating absence of deleterious expansion of concrete due to alkali aggregate reactivity.

D. Field quality-control reports.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: A qualified installer who employs on Project personnel qualified as ACI-certified Flatwork Technician and Finisher and a supervisor who is an ACI-certified Concrete Flatwork Technician.

B. Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C 94/C 94M requirements for production facilities and equipment.
   1. Manufacturer certified according to NRMCA's "Certification of Ready Mixed Concrete Production Facilities."

C. Testing Agency Qualifications: An independent agency qualified according to ASTM C 1077 and ASTM E 329 for testing indicated.
   1. Personnel conducting field tests shall be qualified as ACI Concrete Field Testing Technician, Grade 1, according to ACI CP-1 or an equivalent certification program.
   2. Personnel performing laboratory tests shall be ACI-certified Concrete Strength Testing Technician and Concrete Laboratory Testing Technician - Grade I. Testing Agency laboratory supervisor shall be an ACI-certified Concrete Laboratory Testing Technician - Grade II.

D. Source Limitations: Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant, obtain aggregate from single source, and obtain admixtures from single source from single manufacturer.

E. ACI Publications: Comply with the following unless modified by requirements in the Contract Documents:
   1. ACI 117, "Specifications for Tolerances for Concrete Construction and Materials."

F. Concrete Testing Service: Engage a qualified independent testing agency to perform material evaluation tests and to design concrete mixtures.
G. Preinstallation Conference: Conduct conference at Project site.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Steel Reinforcement: Deliver, store, and handle steel reinforcement to prevent bending and damage.
B. Waterstops: Store waterstops under cover to protect from moisture, sunlight, dirt, oil, and other contaminants.

PART 2 - PRODUCTS

2.1 FORM-FACING MATERIALS

A. Smooth-Formed Finished Concrete: Form-facing panels that will provide continuous, true, and smooth concrete surfaces. Furnish in largest practicable sizes to minimize number of joints.
   1. Plywood, metal, or other approved panel materials.
B. Rough-Formed Finished Concrete: Ground contact EPS, plywood, lumber, metal, or another approved material. Provide lumber dressed on at least two edges and one side for tight fit.
C. Chamfer Strips: Wood, metal, PVC, or rubber strips, 3/4 by 3/4 inch, minimum.
D. Rustication Strips: Wood, metal, PVC, or rubber strips, kerfed for ease of form removal.
E. Form-Release Agent: Commercially formulated form-release agent that will not bond with, stain, or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces.
   1. Formulate form-release agent with rust inhibitor for steel form-facing materials.
F. Form Ties: Factory-fabricated, removable or snap-off metal or glass-fiber-reinforced plastic form ties designed to resist lateral pressure of fresh concrete on forms and to prevent spalling of concrete on removal.

2.2 STEEL REINFORCEMENT

A. Reinforcing Bars: ASTM A 615/A 615M, Grade 60, deformed.
B. Galvanized Reinforcing Bars: ASTM A 615/A 615M, Grade 60, deformed bars, ASTM A 767/A 767M, Class II, at owner's discretion zinc coated after fabrication and bending.
C. Steel Bar Mats: ASTM A 184/A 184M, fabricated from ASTM A 615/A 615M, Grade 60 deformed bars, assembled with clips.
D. Plain-Steel Wire: ASTM A 82/A 82M, as drawn.
E. Deformed-Steel Wire: ASTM A 496/A 496M.

2.3 REINFORCEMENT ACCESSORIES

A. Joint Dowel Bars: ASTM A 615/A 615M, Grade 60, plain-steel bars, cut true to length with ends square and free of burrs.

B. Zinc Repair Material: ASTM A 780, zinc-based solder, paint containing zinc dust, or sprayed zinc.

C. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire reinforcement in place. Manufacture bar supports from steel wire, plastic, or precast concrete according to CRSI's "Manual of Standard Practice," of greater compressive strength than concrete and as follows:
   1. For concrete surfaces exposed to view where legs of wire bar supports contact forms, use CRSI Class 1 plastic-protected steel wire or CRSI Class 2 stainless-steel bar supports.
   2. For zinc-coated reinforcement, use galvanized wire or dielectric-polymer-coated wire bar supports.

2.4 CONCRETE MATERIALS

A. Cementitious Material: Use the following cementitious materials, of the same type, brand, and source, throughout Project:
   1. Portland Cement: ASTM C 150, Type I, Supplement with the following:
      a. Fly Ash: ASTM C 618, Class F.
      b. Ground Granulated Blast-Furnace Slag: ASTM C 989, Grade 100 or 120.

B. Silica Fume: ASTM C 1240, amorphous silica.

C. Normal-Weight Aggregates: ASTM C 33, Class 3M coarse aggregate or better, graded. Provide aggregates from a single source with documented service record data of at least 10 years' satisfactory service in similar applications and service conditions using similar aggregates and cementitious materials.
   1. Maximum Coarse-Aggregate Size: 3/4 inch nominal.

D. Water: ASTM C 94/C 94M and potable.

2.5 ADMIXTURES

A. Air-Entraining Admixture: ASTM C 260.

B. Chemical Admixtures: Provide admixtures certified by manufacturer to be compatible with other admixtures and that will not contribute water-soluble chloride ions exceeding those permitted in hardened concrete. Do not use calcium chloride or admixtures containing calcium chloride.
   1. Water-Reducing Admixture: ASTM C 494/C 494M, Type A.
   2. Retarding Admixture: ASTM C 494/C 494M, Type B.
   3. Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type D.
   4. High-Range, Water-Reducing Admixture: ASTM C 494/C 494M, Type F.
   5. High-Range, Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type G.
   6. Plasticizing and Retarding Admixture: ASTM C 1017/C 1017M, Type II.

2.6 FIBER REINFORCEMENT

A. Synthetic Micro-Fiber: Monofilament polypropylene micro-fibers engineered and designed for use in concrete, complying with ASTM C 1116/C 1116M, Type III, 1/2 to 1-1/2 inches long.
   1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
      a. Monofilament Micro-Fibers:
         1) Axim Italcementi Group, Inc.; Fibrasol II P.
         2) Euclid Chemical Company (The), an RPM company; Fiberstrand.
         3) FORTA Corporation; FORTA Econo-Mono.
         4) Grace Construction Products, W. R. Grace & Co.; Grace MicroFiber.
         5) Metalcrete Industries; Polystrand 1000.
         6) Nycon, Inc.; ProConM.
         7) Propex Concrete Systems Corp.; Fibermesh 150.
         8) Sika Corporation; Sika Fiber PPM.

B. Synthetic Macro-Fiber: Polyolefin macro-fibers engineered and designed for use in concrete, complying with ASTM C 1116/C 1116M, Type III, 1 to 2-1/4 inches long.
   1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
      a. 3M; Scotchcast Polyolefin Fibers [**1"**] [**2"**].
      b. Euclid Chemical Company (The), an RPM company; Tuf-Strand SF.
      c. FORTA Corporation; FORTA FERRO.
      d. Grace Construction Products, W. R. Grace & Co.; Strux 90/40.
      e. Nycon, Inc.; XL.
      f. Propex Concrete Systems Corp.; Fibermesh 650.
      g. Sika Corporation; Sika Fiber.

2.7 WATERSTOPS

Not Applicable

2.8 VAPOR RETARDERS

A. Sheet Vapor Retarder: ASTM E 1745, Class A. Include manufacturer's recommended adhesive or pressure-sensitive tape.
   1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
      a. Carlisle Coatings & Waterproofing, Inc.; Blackline 400.
      b. Fortifiber Building Systems Group; Moistop Ultra 10.
      c. Grace Construction Products, W. R. Grace & Co.; Florprufe 120.
      d. Insulation Solutions, Inc.; Viper VaporCheck 10.
      e. Meadows, W. R., Inc.; Perminator 10 mil.
      f. Raven Industries Inc.; Vapor Block 10.
      g. Reef Industries, Inc.; Griffolyn 10 mil Green.
      h. Stego Industries, LLC; Stego Wrap 10 mil Class A.

B. Sheet Vapor Retarder: Polyethylene sheet, ASTM D 4397, not less than 10 mils thick.

C. Bituminous Vapor Retarder: 110-mil- thick, semiflexible, 7-ply sheet membrane consisting of reinforced core and carrier sheet with fortified asphalt layers, protective weathercoating, and removable plastic release liner. Furnish manufacturer's accessories including bonding asphalt, pointing mastics, and self-adhering joint tape.
   1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
      a. Meadows, W. R., Inc.; Premoulded Membrane Vapor Seal.
   2. Water-Vapor Permeance: 0.00 grains/h x sq. ft. x inches Hg; ASTM E 154.
   3. Tensile Strength: 140 lbf/inch; ASTM E 154.
   4. Puncture Resistance: 90 lbf; ASTM E 154.

D. Granular Fill: Clean mixture of crushed stone or crushed or uncrushed gravel; ASTM D 448, Size 57, with 100 percent passing a 1-1/2-inch sieve and 0 to 5 percent passing a No. 8 sieve. See the notes in the Geotechnical Report for more information.

E. Fine-Graded Granular Material: Clean mixture of crushed stone, crushed gravel, and manufactured or natural sand; ASTM D 448, Size 10, with 100 percent passing a 3/8-inch sieve, 10 to 30 percent passing a No. 100 sieve, and at least 5 percent passing No. 200 sieve; complying with deleterious substance limits of ASTM C 33 for fine aggregates. See the notes in the Geotechnical Report for more information.

2.9 FLOOR AND SLAB TREATMENTS

A. Slip-Resistive Emery Aggregate Finish: Factory-graded, packaged, rustproof, nonglazing, abrasive, crushed emery aggregate containing not less than 50 percent aluminum oxide and not less than 20 percent ferric oxide; unaffected by freezing, moisture, and cleaning materials with 100 percent passing No. 4 sieve.
   1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
      a. Anti-Hydro International, Inc.; Emery.
      b. Dayton Superior Corporation; Emery Tuff Non-Slip.
      c. Lambert Corporation; EMAG-20.
      d. L&M Construction Chemicals, Inc.; Grip It.
      e. Metalcrete Industries; Metco Anti-Skid Aggregate.

B. Slip-Resistive Aluminum Granule Finish: Factory-graded, packaged, rustproof, nonglazing, abrasive aggregate of not less than 95 percent fused aluminum-oxide granules.
   1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
      a. Anti-Hydro International, Inc.; A-H Alox.
      b. BASF Construction Chemicals - Building Systems; Frictex NS.
      c. L&M Construction Chemicals, Inc.; Grip It AO.

C. Emery Dry-Shake Floor Hardener: factory-packaged, dry combination of portland cement, graded emery aggregate, and plasticizing admixture; with emery aggregate consisting of no less than 60 percent of total aggregate content.
   1. Color: As selected by Architect from manufacturer's full range.

D. Metallic Dry-Shake Floor Hardener: factory-packaged, dry combination of portland cement, graded metallic aggregate, rust inhibitors, and plasticizing admixture; with metallic aggregate consisting of no less than 65 percent of total aggregate content.

E. Unpigmented Mineral Dry-Shake Floor Hardener: Factory-packaged dry combination of portland cement, graded quartz aggregate, and plasticizing admixture.
   1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
      a. BASF Construction Chemicals - Building Systems; Maximent.
      b. ChemMasters; ConColor.
      c. Conspec by Dayton Superior; Conshake 500.
      d. Dayton Superior Corporation; Quartz Tuff.
      e. Edoco by Dayton Superior; Burke Non Metallic Floor Hardener 250.
      f. Euclid Chemical Company (The), an RPM company; Surflex.
      g. Kaufman Products, Inc.; Tycron.
      h. Lambert Corporation; Colorhard.
      i. L&M Construction Chemicals, Inc.; Quartzplate FF.
      j. Metalcrete Industries; Floor Quartz.
      k. Scofield, L. M. Company; Lithochrome Color Hardener.
      l. Symons by Dayton Superior; Hard Top.

F. Pigmented Mineral Dry-Shake Floor Hardener: Factory-packaged, dry combination of portland cement, graded quartz aggregate, color pigments, and plasticizing admixture. Use color pigments that are finely ground, nonfading mineral oxides interground with cement.
   1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
      a. BASF Construction Chemicals - Building Systems; Mastercron.
      b. ChemMasters; ConColor.
      c. Conspec by Dayton Superior; Conshake 600 Colortone.
      d. Dayton Superior Corporation; Quartz Tuff.
      e. Edoco by Dayton Superior; Burke Non Metallic Floor Hardener 200 - 205.
      f. Euclid Chemical Company (The), an RPM company; Surflex.
      g. Kaufman Products, Inc.; Tycron.
      h. Lambert Corporation; Colorhard.
      i. L&M Construction Chemicals, Inc.; Quartz Plate FF.
      j. Metalcrete Industries; Floor Quartz.
      k. Scofield, L. M. Company; Lithochrome Color Hardener.
      l. Symons by Dayton Superior; Color Hardener.
   2. Color: As selected by Architect from manufacturer's full range.

2.10 LIQUID FLOOR TREATMENTS

A. VOC Content: Liquid floor treatments shall have a VOC content of 200 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

B. Penetrating Liquid Floor Treatment: Clear, chemically reactive, waterborne solution of inorganic silicate or siliconate materials and proprietary components; odorless; that penetrates, hardens, and densifies concrete surfaces.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
   a. ChemMasters; Chemisil Plus.
   b. ChemTec Int'l; ChemTec One.
   c. Conspec by Dayton Superior; Intraseal.
   d. Curecrete Distribution Inc.; Ashford Formula.
   e. Dayton Superior Corporation; Day-Chem Sure Hard (J-17).
   f. Edoco by Dayton Superior; Titan Hard.
   g. Euclid Chemical Company (The), an RPM company; Euco Diamond Hard.
   h. Kaufman Products, Inc.; SureHard.
   i. L&M Construction Chemicals, Inc.; Seal Hard.
   j. Meadows, W. R., Inc.; LIQUI-HARD.
   k. Metalcrete Industries; Floorsaver.
   l. Nox-Crete Products Group; Duro-Nox.
   m. Symons by Dayton Superior; Buff Hard.
   n. US SPEC, Division of US Mix Products Company; US SPEC Industraseal.
   o. Vexcon Chemicals, Inc.; Vexcon StarSeal PS Clear.

C. Penetrating Liquid Floor Treatments for Polished Concrete Finish: Clear, waterborne solution of inorganic silicate or siliconate materials and proprietary components; odorless; that penetrates, hardens, and is suitable for polished concrete surfaces.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
   a. Advanced Floor Products; Retro-Plate 99.
   b. L&M Construction Chemicals, Inc.; FGS Hardener Plus.
   c. QuestMark, a division of CentiMark Corporation; DiamondQuest Densifying Impregnator Application.

2.11 CURING MATERIALS

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

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
   a. Axim Italcementi Group, Inc.; CATEXOL CimFilm.
   b. BASF Construction Chemicals - Building Systems; Confilm.
   c. ChemMasters; SprayFilm.
   d. Conspec by Dayton Superior; Aquafilm.
   e. Dayton Superior Corporation; Sure Film (J-74).

f. Edoco by Dayton Superior; BurkeFilm.
g. Euclid Chemical Company (The), an RPM company; Eucobar.
h. Kaufman Products, Inc.; Vapor-Aid.
i. Lambert Corporation; LAMBCO Skin.
j. L&M Construction Chemicals, Inc.; E-CON.
k. Meadows, W. R., Inc.; EVAPRE.
l. Metalcrete Industries; Waterhold.
m. Nox-Crete Products Group; MONOFILM.
n. Sika Corporation; SikaFilm.
o. SpecChem, LLC; Spec Film.
p. Symons by Dayton Superior; Finishing Aid.
q. TK Products, Division of Sierra Corporation; TK-2120 TRI-FILM.
r. Unitex; PRO-FILM.
s. Vexcon Chemicals, Inc.; Certi-Vex Envio Set.

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

C. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.

D. Water: Potable.

E. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B, dissipating.
1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
a. Anti-Hydro International, Inc.; AH Curing Compound #2 DR WB.
b. BASF Construction Chemicals - Building Systems; Kure 200.
c. ChemMasters; Safe-Cure Clear.
d. Conspec by Dayton Superior; W.B. Resin Cure.
e. Dayton Superior Corporation; Day-Chem Rez Cure (J-11-W).
f. Edoco by Dayton Superior; Res X Cure WB.
g. Euclid Chemical Company (The), an RPM company; Kurez W VOX; TAMMSCURE WB 30C.
h. Kaufman Products, Inc.; Thinfilm 420.
i. Lambert Corporation; AQUA KURE - CLEAR.
j. L&M Construction Chemicals, Inc.; L&M Cure R.
k. Meadows, W. R., Inc.; 1100-CLEAR.
l. Nox-Crete Products Group; Resin Cure E.
m. Right Pointe; Clear Water Resin.
n. SpecChem, LLC; Spec Rez Clear.
o. Symons by Dayton Superior; Resi-Chem Clear.
p. TK Products, Division of Sierra Corporation; TK-2519 DC WB.
q. Vexcon Chemicals, Inc.; Certi-Vex Enviocure 100.

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

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
    a. Anti-Hydro International, Inc.; AH Clear Cure WB.
    b. BASF Construction Chemicals - Building Systems; Kure-N-Seal WB.
    c. ChemMasters; Safe-Cure & Seal 20.
    d. Conspec by Dayton Superior; Cure and Seal WB.
    e. Cresset Chemical Company; Crete-Trete 309-VOC Cure & Seal.
    f. Dayton Superior Corporation; Safe Cure and Seal (J-18).
    g. Edoco by Dayton Superior; Spartan Cote WB II.
    h. Euclid Chemical Company (The), an RPM company; Aqua Cure VOX; Clearseal WB 150.
    i. Kaufman Products, Inc.; Cure & Seal 309 Emulsion.
    j. Lambert Corporation; Glazecote Sealer-20.
    k. L&M Construction Chemicals, Inc.; Dress & Seal WB.
    l. Meadows, W. R., Inc.; Vocomp-20.
    m. Metalcrete Industries; Metcure.
    n. Nox-Crete Products Group; Cure & Seal 150E.
    o. Symons by Dayton Superior; Cure & Seal 18 Percent E.
    p. TK Products, Division of Sierra Corporation; TK-2519 WB.
    q. Vexcon Chemicals, Inc.; Starseal 309.

G. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B, 18 to 25 percent solids, nondissipating.
1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
    a. BASF Construction Chemicals - Building Systems; Kure-N-Seal W.
    b. ChemMasters; Safe-Cure Clear.
    c. Conspec by Dayton Superior; High Seal.
    d. Dayton Superior Corporation; Safe Cure and Seal (J-19).
    e. Edoco by Dayton Superior; Spartan Cote WB II 20 Percent.
    f. Euclid Chemical Company (The), an RPM company; Diamond Clear VOX; Clearseal WB STD.
    g. Kaufman Products, Inc.; SureCure Emulsion.
    h. Lambert Corporation; Glazecote Sealer-20.
    i. L&M Construction Chemicals, Inc.; Dress & Seal WB.
    j. Meadows, W. R., Inc.; Vocomp-20.
    k. Metalcrete Industries; Metcure 0800.
    l. Nox-Crete Products Group; Cure & Seal 200E.
    m. Symons by Dayton Superior; Cure & Seal 18 Percent E.
    n. Vexcon Chemicals, Inc.; Starseal 0800.

H. Clear, Solvent-Borne, Membrane-Forming Curing and Sealing Compound: ASTM C 1315, Type 1, Class A.
1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

a. BASF Construction Chemicals - Building Systems; Kure-N-Seal 25 LV.
b. ChemMasters; Spray-Cure & Seal Plus.
c. Conspec by Dayton Superior; Sealcure 1315.
d. Dayton Superior Corporation; Day-Chem Cure and Seal (J-22UV).
e. Edoco by Dayton Superior; Cureseal 1315.
f. Euclid Chemical Company (The), an RPM company; Super Diamond Clear; LusterSeal 300.
g. Kaufman Products, Inc.; Sure Cure 25.
h. Lambert Corporation; UV Super Seal.
i. L&M Construction Chemicals, Inc.; Lumiseal Plus.
j. Meadows, W. R., Inc.; CS-309/30.
k. Metalcrete Industries; Seal N Kure 30.
l. Right Pointe; Right Sheen 30.
m. Vexcon Chemicals, Inc.; Certi-Vex AC 1315.

I. Clear, Waterborne, Membrane-Forming Curing and Sealing Compound: ASTM C 1315, Type 1, Class A.
1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
a. BASF Construction Chemicals - Building Systems; Kure 1315.
b. ChemMasters; Polyseal WB.
c. Conspec by Dayton Superior; Sealcure 1315 WB.
d. Edoco by Dayton Superior; Cureseal 1315 WB.
e. Euclid Chemical Company (The), an RPM company; Super Diamond Clear VOX; LusterSeal WB 300.
f. Kaufman Products, Inc.; Sure Cure 25 Emulsion.
g. Lambert Corporation; UV Safe Seal.
h. L&M Construction Chemicals, Inc.; Lumiseal WB Plus.
i. Meadows, W. R., Inc.; Vocomp-30.
j. Metalcrete Industries; Metcure 30.
k. Right Pointe; Right Sheen WB30.
l. Symons by Dayton Superior; Cure & Seal 31 Percent E.
m. Vexcon Chemicals, Inc.; Vexcon Starseal 1315.

2.12 RELATED MATERIALS

A. Expansion- and Isolation-Joint-Filler Strips: ASTM D 1751, asphalt-saturated cellulosic fiber or ASTM D 1752, cork or self-expanding cork.

B. Semirigid Joint Filler: Two-component, semirigid, 100 percent solids, epoxy resin with a Type A shore durometer hardness of 80, or aromatic polyurea with a Type A shore durometer hardness range of 90 to 95 per ASTM D 2240.

C. Bonding Agent: ASTM C 1059/C 1059M, Type II, non-redispersible, acrylic emulsion or styrene butadiene.

D. Epoxy Bonding Adhesive: ASTM C 881, two-component epoxy resin, capable of humid curing and bonding to damp surfaces, of class suitable for application temperature and of grade to suit requirements, and as follows:
   1. Types IV and V, load bearing, for bonding hardened or freshly mixed concrete to hardened concrete.

E. Reglets: Fabricate reglets of not less than 0.022-inch- thick, galvanized-steel sheet. Temporarily fill or cover face opening of reglet to prevent intrusion of concrete or debris.

F. Dovetail Anchor Slots: Hot-dip galvanized-steel sheet, not less than 0.034 inch thick, with bent tab anchors. Temporarily fill or cover face opening of slots to prevent intrusion of concrete or debris.

2.13 REPAIR MATERIALS

A. Repair Underlayment: Cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/8 inch and that can be feathered at edges to match adjacent floor elevations.
   1. Cement Binder: ASTM C 150, portland cement or hydraulic or blended hydraulic cement as defined in ASTM C 219.
   2. Primer: Product of underlayment manufacturer recommended for substrate, conditions, and application.
   3. Aggregate: Well-graded, washed gravel, 1/8 to 1/4 inch or coarse sand as recommended by underlayment manufacturer.
   4. Compressive Strength: Not less than 4100 psi at 28 days when tested according to ASTM C 109/C 109M.

B. Repair Overlayment: Cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/4 inch and that can be filled in over a scarified surface to match adjacent floor elevations.
   1. Cement Binder: ASTM C 150, portland cement or hydraulic or blended hydraulic cement as defined in ASTM C 219.
   2. Primer: Product of topping manufacturer recommended for substrate, conditions, and application.
   3. Aggregate: Well-graded, washed gravel, 1/8 to 1/4 inch or coarse sand as recommended by topping manufacturer.
   4. Compressive Strength: Not less than 5000 psi at 28 days when tested according to ASTM C 109/C 109M.

2.14 CONCRETE MIXTURES, GENERAL

A. Prepare design mixtures for each type and strength of concrete, proportioned on the basis of laboratory trial mixture or field test data, or both, according to ACI 301.
   1. Use a qualified independent testing agency for preparing and reporting proposed mixture designs based on laboratory trial mixtures.

B. Cementitious Materials: Limit percentage, by weight, of cementitious materials other than portland cement in concrete as follows:
   1. Fly Ash: 25 percent.

2. Combined Fly Ash and Pozzolan: 25 percent.
3. Ground Granulated Blast-Furnace Slag: 50 percent.
4. Combined Fly Ash or Pozzolan and Ground Granulated Blast-Furnace Slag: 50 percent portland cement minimum, with fly ash or pozzolan not exceeding 25 percent.
5. Silica Fume: 10 percent.
6. Combined Fly Ash, Pozzolans, and Silica Fume: 35 percent with fly ash or pozzolans not exceeding 25 percent and silica fume not exceeding 10 percent.
7. Combined Fly Ash or Pozzolans, Ground Granulated Blast-Furnace Slag, and Silica Fume: 50 percent with fly ash or pozzolans not exceeding 25 percent and silica fume not exceeding 10 percent.

C. Limit water-soluble, chloride-ion content in hardened concrete to 0.30 percent by weight of cement.

D. Admixtures: Use admixtures according to manufacturer's written instructions.
1. Use water-reducing high-range water-reducing or plasticizing admixture 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.
3. Use water-reducing admixture in pumped concrete, concrete for heavy-use industrial slabs and parking structure slabs, concrete required to be watertight, and concrete with a water-cementitious materials ratio below 0.50.
4. Use corrosion-inhibiting admixture in concrete mixtures where indicated.

2.15 CONCRETE MIXTURES FOR BUILDING ELEMENTS

A. Integral Grade Beams and Structural Slabs, Poured on-Grade: Proportion normal-weight concrete mixture as follows:
1. Minimum Compressive Strength: 5000 psi at 28 days.
2. Minimum Cementitious Materials Content: 540 lb/cu. yd..
3. Slump Limit: 5 inches, plus or minus 1.5 inch, unless high range plasticizer is used.
4. Air Content: 6 percent, plus or minus 1.5 percent at point of delivery for 3/4-inch nominal maximum aggregate size.
5. Air Content: Do not allow air content of trowel-finished floors to exceed 3 percent.

B. Building Walls: Proportion normal-weight concrete mixture as follows:
1. Minimum Compressive Strength: 4000 psi at 28 days.
2. Maximum Water-Cementitious Materials Ratio: 0.45.
3. Slump Limit: 5 inches, plus or minus 1 inch.
4. Air Content: **6** percent, plus or minus 1.5 percent at point of delivery for 3/4-inch nominal maximum aggregate size.

2.16 FABRICATING REINFORCEMENT

A. Fabricate steel reinforcement according to CRSI's "Manual of Standard Practice."

2.17 CONCRETE MIXING

A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C 94/C 94M, and furnish batch ticket information.
   1. When air temperature is between 85 and 90 deg F, reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F, reduce mixing and delivery time to 60 minutes.

B. Project-Site Mixing: Measure, batch, and mix concrete materials and concrete according to ASTM C 94/C 94M. Mix concrete materials in appropriate drum-type batch machine mixer.
   1. For mixer capacity of 1 cu. yd. or smaller, continue mixing at least 1-1/2 minutes, but not more than 5 minutes after ingredients are in mixer, before any part of batch is released.
   2. For mixer capacity larger than 1 cu. yd., increase mixing time by 15 seconds for each additional 1 cu. yd..
   3. Provide batch ticket for each batch discharged and used in the Work, indicating Project identification name and number, date, mixture type, mixture time, quantity, and amount of water added. Record approximate location of final deposit in structure.

PART 3 - EXECUTION

3.1 FORMWORK

A. Design, erect, shore, brace, and maintain formwork, according to ACI 301, to support vertical, lateral, static, and dynamic loads, and construction loads that might be applied, until structure can support such loads.

B. Construct formwork so concrete members and structures are of size, shape, alignment, elevation, and position indicated, within tolerance limits of ACI 117.

C. Limit concrete surface irregularities, designated by ACI 347 as abrupt or gradual, as follows:
   1. Class A, 1/8 inchfor smooth-formed finished surfaces.
   2. Class B, 1/4 inch for rough-formed finished surfaces.

D. Construct forms tight enough to prevent loss of concrete paste.

E. Fabricate forms for easy removal 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.
   1. Install keyways, reglets, recesses, and the like, for easy removal.
   2. Do not use rust-stained steel form-facing material.

F. Set edge forms, bulkheads, and intermediate screed strips for slabs to achieve required elevations and slopes in finished concrete surfaces. Provide and secure units to support screed strips; use strike-off templates or compacting-type screeds.

G. Provide temporary openings for cleanouts and inspection ports where interior area of formwork is inaccessible. Close openings with panels tightly fitted to forms and securely

braced to prevent loss of concrete mortar. Locate temporary openings in forms at inconspicuous locations.

H. Chamfer exterior corners and edges of permanently exposed concrete, per structural drawings.

I. Form openings, chases, offsets, sinkages, keyways, reglets, blocking, screeds, and bulkheads required in the Work. Determine sizes and locations from trades providing such items.

J. Clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, and other debris just before placing concrete.

K. Retighten forms and bracing before placing concrete, as required, to prevent mortar leaks and maintain proper alignment.

L. Coat contact surfaces of forms, which are to be removed, with form-release agent, according to manufacturer's written instructions, before placing reinforcement.

3.2 EMBEDDED ITEMS

A. 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.

1. Install anchor rods, accurately located, to elevations required and complying with tolerances in Section 7.5 of AISC's "Code of Standard Practice for Steel Buildings and Bridges."

3.3 REMOVING AND REUSING FORMS

A. General: 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 deg F for **24** hours after placing concrete. Concrete has to be hard enough to not be damaged by form-removal operations and curing and protection operations need to be maintained.

B. Clean and repair surfaces of forms to be reused in the Work. Split, frayed, delaminated, or otherwise damaged form-facing material will not be acceptable for exposed surfaces. Apply new form-release agent.

C. 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 for exposed concrete surfaces unless approved by Architect.

3.4 SHORES AND RESHORES

A. Comply with ACI 318 and ACI 301 for design, installation, and removal of shoring and reshoring.

1. Do not remove shoring or reshoring until measurement of slab tolerances is complete.

B. Plan sequence of removal of shores and reshore to avoid damage to concrete. Locate and provide adequate reshoring to support construction without excessive stress or deflection.

3.5 VAPOR RETARDERS

A. Sheet Vapor Retarders: Place, protect, and repair sheet vapor retarder according to ASTM E 1643 and manufacturer's written instructions.
   1. Lap joints 6 inches and seal with manufacturer's recommended tape.
B. Bituminous Vapor Retarders: Place, protect, and repair bituminous vapor retarder according to manufacturer's written instructions.
C. Granular Course: Cover vapor retarder with granular fill, moisten, and compact with mechanical equipment to elevation tolerances of plus 0 inch or minus 3/4 inch.
   1. Place and compact a 1/2-inch- thick layer of fine-graded granular material over granular fill in any areas necessary.

3.6 STEEL REINFORCEMENT

A. General: Comply with CRSI's "Manual of Standard Practice" for placing reinforcement.
B. Clean reinforcement of loose rust and mill scale, earth, ice, and other foreign materials that would reduce bond to 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. Set wire ties with ends directed into concrete, not toward exposed concrete surfaces.
E. Install welded wire reinforcement in longest practicable lengths on bar supports spaced to minimize sagging. Lap edges and ends of adjoining sheets at least one mesh spacing. Offset laps of adjoining sheet widths to prevent continuous laps in either direction. Lace overlaps with wire.
F. Zinc-Coated Reinforcement: Repair cut and damaged zinc coatings with zinc repair material according to ASTM A 780. Use galvanized steel wire ties to fasten zinc-coated steel reinforcement.

3.7 JOINTS

A. General: 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 of Record.
   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 keyed joints as indicated. Embed keys at least 2-1/2 inches into concrete.
   3. Locate joints for beams, slabs, joists, and girders at approximately one third of spans. Offset joints in girders a minimum distance of twice the beam width from a beam-girder intersection.
   4. Locate horizontal joints in walls and columns at underside of floors, slabs, beams, and girders and at the 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 a bonding agent at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.

C. Contraction Joints in Structural Slabs formed on-Grade: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least [**one-fourth**] 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 groover 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 adjacent apron slabs.
   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, specified in Division 07 Section "Joint Sealants," are indicated.
   3. Install joint-filler strips in lengths as long as practicable. Where more than one length is required, lace or clip sections together.

E. Doweled Joints: Install dowel bars and support assemblies at joints where indicated. Lubricate or asphalt coat one-half of dowel length to prevent concrete bonding to one side of joint.

3.8 CONCRETE PLACEMENT

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

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

C. Before test sampling and placing concrete, water may be added at Project site, subject to limitations of ACI 301.
   1. Do not add water to concrete after adding high-range water-reducing admixtures to mixture.

D. Deposit concrete continuously in one layer or in horizontal layers of such thickness that no new 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 indicated. Deposit concrete to avoid segregation.
   1. Deposit concrete in horizontal layers of depth to not exceed formwork design pressures and in a manner to avoid inclined construction joints.
   2. Deposit concrete in such a manner as to avoid floatation and/or misalignment of underlying EPS foam.

3. Consolidate placed concrete with mechanical vibrating equipment according to ACI 301.
4. Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations to rapidly penetrate placed layer 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 to time necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing mixture constituents to segregate.

E. Deposit and consolidate concrete for floors and slabs in a continuous operation, within limits of construction joints, until placement of a 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 where required.**
5. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane, before excess bleedwater appears on the surface. Do not further disturb slab surfaces before starting finishing operations.

F. Cold-Weather Placement: Comply with ACI 306.1 and as follows. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.
1. When average high and low temperature is expected to fall below 40 deg F for three successive days, maintain delivered concrete mixture temperature within the temperature range required by ACI 301.
2. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.
3. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in mixture designs.

G. Hot-Weather Placement: Comply with ACI 301 and as follows:
1. Maintain concrete temperature below 90 deg 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. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade uniformly moist without standing water, soft spots, or dry areas.

3.9 FINISHING FORMED SURFACES

A. Rough-Formed Finish: As-cast concrete texture imparted by form-facing material with tie holes and defects repaired and patched. Remove fins and other projections that exceed specified limits on formed-surface irregularities.
1. Apply to concrete surfaces **not exposed to public view.**

B. Smooth-Formed Finish: As-cast concrete texture imparted by form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams. Repair and patch tie holes and defects. Remove fins and other projections that exceed specified limits on formed-surface irregularities.
   1. Apply to concrete surfaces **exposed to public view, to receive a rubbed finish,** or **to be covered with a coating or covering material applied directly to concrete**.

C. Rubbed Finish: Apply the following to smooth-formed finished as-cast concrete where indicated:
   1. Smooth-Rubbed Finish: Not later than one day after form removal, moisten concrete surfaces and rub with carborundum brick or another abrasive until producing a uniform color and texture. Do not apply cement grout other than that created by the rubbing process.
   2. Grout-Cleaned Finish: Wet concrete surfaces and apply grout of a consistency of thick paint to coat surfaces and fill small holes. Mix one part portland cement to one and one-half parts fine sand with a 1:1 mixture of bonding admixture and water. Add white portland cement in amounts determined by trial patches so color of dry grout will match adjacent surfaces. Scrub grout into voids and remove excess grout. When grout whitens, rub surface with clean burlap and keep surface damp by fog spray for at least 36 hours.
   3. Cork-Floated Finish: Wet concrete surfaces and apply a stiff grout. Mix one part portland cement and one part fine sand with a 1:1 mixture of bonding agent and water. Add white portland cement in amounts determined by trial patches so color of dry grout will match adjacent surfaces. Compress grout into voids by grinding surface. In a swirling motion, finish surface with a cork float.

D. Related Unformed Surfaces: At tops of walls, horizontal offsets, and similar unformed surfaces adjacent to formed surfaces, strike off smooth and finish with a texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces unless otherwise indicated.

3.10 FINISHING FLOORS AND SLABS

A. General: Comply with ACI 302.1R recommendations for screeding, restraightening, and finishing operations for concrete surfaces. Do not wet concrete surfaces during finishing.

B. Scratch Finish: While still plastic, texture concrete surface that has been screeded and bull-floated or darbied. Use stiff brushes, brooms, or rakes to produce a profile amplitude of 1/4 inch in one direction.
   1. Apply scratch finish to surfaces **indicated**.

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

D. Trowel Finish: After applying float finish, apply first troweling and consolidate concrete by hand or power-driven trowel. Continue troweling passes and restraighten 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.

1. Apply a trowel finish to surfaces **indicated**.
2. Finish surfaces to the following tolerances, according to ASTM E 1155, for a randomly trafficked floor surface:

E. Trowel and Fine-Broom Finish: Apply a first trowel finish to surfaces while concrete is still plastic, slightly scarify surface with a fine broom.

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

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

3.11 MISCELLANEOUS CONCRETE ITEMS

A. Filling In: Fill in holes and openings left in concrete structures after work of other trades is in place unless otherwise indicated. Mix, place, and cure concrete, as specified, to blend with in-place construction. Provide other miscellaneous concrete filling indicated or required to complete the Work.

B. Equipment Bases and Foundations: Provide machine and equipment bases and foundations as shown on Drawings. Set anchor bolts for machines and equipment at correct elevations, complying with diagrams or templates from manufacturer furnishing machines and equipment.

3.12 CONCRETE PROTECTING AND CURING

A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection and ACI 301 for hot-weather protection during curing.

B. Evaporation Retarder: Apply evaporation retarder to unformed concrete surfaces if uncontrolled (such as through covering / wet curing) hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.

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 for the remainder of the curing period.

D. Unformed Surfaces: Begin curing immediately after finishing concrete. Cure unformed surfaces, including floors and slabs, concrete floor toppings, and other surfaces.

E. Cure concrete integral slab according to ACI 308.1, by one or a combination of the following methods:

1. Moisture Curing: Keep surfaces continuously moist for not less than seven 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 with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches, and sealed by waterproof tape or adhesive. Cure for not less than seven 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 coverings with either a moisture-retaining cover or a curing compound that the manufacturer certifies will not interfere with bonding of floor covering used on Project.

3.13 LIQUID FLOOR TREATMENTS

A. Penetrating Liquid Floor Treatment: Prepare, apply, and finish penetrating liquid floor treatment according to manufacturer's written instructions.
   1. Remove curing compounds, sealers, oil, dirt, laitance, and other contaminants and complete surface repairs.
   2. Do not apply to concrete that is less than **seven** days' old.
   3. Apply liquid until surface is saturated, scrubbing into surface until a gel forms; rewet; and repeat brooming or scrubbing. Rinse with water; remove excess material until surface is dry. Apply a second coat in a similar manner if surface is rough or porous.

B. Polished Concrete Floor Treatment: Apply polished concrete finish system to cured and prepared slabs to match accepted mockup.
   1. Machine grind floor surfaces to receive polished finishes level and smooth.
   2. Apply penetrating liquid floor treatment for polished concrete in polishing sequence and according to manufacturer's written instructions, allowing recommended drying time between successive coats.
   3. Continue polishing with progressively finer grit diamond polishing pads to gloss level to match approved mockup.
   4. Control and dispose of waste products produced by grinding and polishing operations.
   5. Neutralize and clean polished floor surfaces.

3.14 JOINT FILLING

A. Prepare, clean, and install joint filler according to manufacturer's written instructions.
B. Remove dirt, debris, saw cuttings, curing compounds, and sealers from joints; leave contact faces of joint clean and dry.

C. Install semirigid joint filler full depth in saw-cut joints and at least 2 inches deep in formed joints. Overfill joint and trim joint filler flush with top of joint after hardening.

3.15 CONCRETE SURFACE REPAIRS

A. Defective Concrete: Repair and patch defective areas when approved by Engineer. Remove and replace concrete that cannot be repaired and patched to Engineer's approval.

B. Patching Mortar: Mix dry-pack patching mortar, consisting of one part portland cement to two and one-half parts fine aggregate passing a No. 16 sieve, using only enough water for handling and placing.

C. Repairing Formed Surfaces: Surface defects include color and texture irregularities, cracks, spalls, air bubbles, honeycombs, rock pockets, fins and other projections on the surface, and stains and other discolorations that cannot be removed by cleaning.

1. Immediately after form removal, cut out honeycombs, rock pockets, and voids more than 1/2 inch in any dimension to solid concrete. Limit cut depth to 3/4 inch. Make edges of cuts perpendicular to concrete surface. Clean, dampen with water, and brush-coat holes and voids with bonding agent. Fill and compact with patching mortar before bonding agent has dried. Fill form-tie voids with patching mortar or cone plugs secured in place with bonding agent.
2. Repair defects on surfaces exposed to view by blending white portland cement and standard portland cement so that, when dry, patching mortar will match surrounding color. Patch a test area at inconspicuous locations to verify mixture and color match before proceeding with patching. Compact mortar in place and strike off slightly higher than surrounding surface.
3. Repair defects on concealed formed surfaces that affect concrete's durability and structural performance as determined by Architect.

D. Repairing Unformed Surfaces: Test unformed surfaces, such as floors and slabs, for finish and verify surface tolerances specified for each surface. Correct low and high areas. Test surfaces sloped to drain for trueness of slope and smoothness; use a sloped template.

1. Repair finished surfaces containing defects. Surface defects include spalls, popouts, honeycombs, rock pockets, crazing and cracks in excess of 0.01 inch wide or that penetrate to reinforcement or completely through unreinforced sections regardless of width, and other objectionable conditions.
2. After concrete has cured at least 14 days, correct high areas by grinding.
3. Correct localized low areas during or immediately after completing surface finishing operations by cutting out low areas and replacing with patching mortar. Finish repaired areas to blend into adjacent concrete.
4. Repair defective areas, except random cracks and single holes 1 inch or less in diameter, by cutting out and replacing with fresh concrete. Remove defective areas with clean, square cuts and expose steel reinforcement with at least a 3/4-inch clearance all around. Dampen concrete surfaces in contact with patching concrete and apply bonding agent. Mix patching concrete of same materials and mixture as

original concrete except without coarse aggregate. Place, compact, and finish to blend with adjacent finished concrete. Cure in same manner as adjacent concrete.

5. Repair random cracks and single holes 1 inch or less in diameter with patching mortar. Groove top of cracks and cut out holes to sound concrete and clean off dust, dirt, and loose particles. Dampen cleaned concrete surfaces and apply bonding agent. Place patching mortar before bonding agent has dried. Compact patching mortar and finish to match adjacent concrete. Keep patched area continuously moist for at least 72 hours.

E. Perform structural repairs of concrete, subject to Engineer's approval, using epoxy adhesive and patching mortar.

F. Repair materials and installation not specified above may be used, subject to Architect's approval.

3.16 FIELD QUALITY CONTROL

A. Testing and Inspecting: Owner will engage a **special inspector** to perform field tests and inspections and prepare test reports.

B. Inspections:
   1. Steel reinforcement placement.
   2. Verification of use of required design mixture.
   3. Concrete placement, including conveying and depositing.
   4. Curing procedures and maintenance of curing temperature.
   5. Verification of concrete strength before removal of shores and forms from beams and slabs.

C. Concrete Tests: Testing of composite samples of fresh concrete obtained according to ASTM C 172 shall be performed according to the following requirements:
   1. Testing Frequency: Obtain one composite sample for each day's pour of each concrete mixture exceeding 5 cu. yd., but less than 25 cu. yd., plus one set for each additional 50 cu. yd. or fraction thereof.
      a. When frequency of testing will provide fewer than five compressive-strength tests for each concrete mixture, testing shall be conducted from at least five randomly selected batches or from each batch if fewer than five are used.
   2. Slump: ASTM C 143/C 143M; one test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mixture. Perform additional tests when concrete consistency appears to change.
   3. Air Content: ASTM C 231, pressure method, for normal-weight concrete; one test for each composite sample, but not less than one test for each day's pour of each concrete mixture.
   4. Concrete Temperature: ASTM C 1064/C 1064M; one test hourly when air temperature is 40 deg F and below, and when 80 deg F and above; and one test for each composite sample.
   5. Compression Test Specimens: ASTM C 31/C 31M.
      a. Cast and laboratory cure two sets of two standard cylinder specimens for each composite sample.

b. Cast and field cure one set of two standard cylinder specimens for each composite sample.

6. Compressive-Strength Tests: ASTM C 39/C 39M; test one set of one laboratory-cured specimen at 7 days and one set of three specimens at 28 days (hold if necessary to verify strength).
   a. Test one set of one field-cured specimen at 7 days and one set of three specimens at 28 days.
   b. A compressive-strength test shall be the average compressive strength from a set of two specimens obtained from same composite sample and tested at age indicated.
7. When strength of field-cured cylinders is less than 85 percent of companion laboratory-cured cylinders, Contractor shall evaluate operations and provide corrective procedures for protecting and curing in-place concrete.
8. Strength of each concrete mixture will be satisfactory if every average of any three consecutive compressive-strength tests equals or exceeds specified compressive strength and no compressive-strength test value falls below specified compressive strength by more than 500 psi.
9. Test results shall be reported in writing to Architect, concrete manufacturer, and Contractor within 48 hours of testing. Reports of compressive-strength tests shall contain Project identification name and number, date of concrete placement, name of concrete testing and inspecting agency, location of concrete batch in Work, design compressive strength at 28 days, concrete mixture proportions and materials, compressive breaking strength, and type of break for both 7- and 28-day tests.
10. Nondestructive Testing: Rebound (Schmidt) hammer, sonoscope, or other nondestructive device may be permitted by Architect but will not be used as sole basis for approval or rejection of concrete. If rebound hammer testing is used, a core sample of the same batch type of concrete should be tested and broken in order to match the strength curves per ASTM recommendations (ASTM C805). Any coring must have location approved by the Engineer prior to execution.
11. Additional Tests: Testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Architect. Testing and inspecting agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C 42/C 42M or by other methods as directed by Architect.
12. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
13. Correct deficiencies in the Work that test reports and inspections indicate do not comply with the Contract Documents.

3.17 PROTECTION OF LIQUID FLOOR TREATMENTS

A. Protect liquid floor treatment from damage and wear during the remainder of construction period. Use protective methods and materials, including temporary covering, recommended in writing by liquid floor treatments installer.

END OF SECTION 03 30 00

SECTION 08 11 13
HOLLOW METAL DOORS AND FRAMES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes hollow-metal work.

B. Related Requirements:

1. "Door Hardware" for door hardware for hollow-metal doors and frames.

1.3 DEFINITIONS

A. Minimum Thickness: Minimum thickness of base metal without coatings according to NAAMM-HMMA 803 or SDI A250.8.

1.4 COORDINATION

A. Coordinate anchorage installation for hollow-metal frames. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors. Deliver such items to Project site in time for installation.

1.5 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details, material descriptions, core descriptions, fire-resistance ratings, and finishes.

B. Samples for Initial Selection: For units with factory-applied color finishes.

1.6 INFORMATIONAL SUBMITTALS

A. Product Test Reports: For each type of hollow-metal frame assembly, for tests performed by a qualified testing agency.

B. Oversize Construction Certification: For assemblies required to be fire rated and

exceeding limitations of labeled assemblies.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver hollow-metal work palletized, packaged, or crated to provide protection during transit and Project-site storage. Do not use non-vented plastic.

B. Deliver welded frames with two (2) removable spreader bars across bottom of frames, tack welded to jambs and mullions.

C. Store hollow-metal work vertically under cover at Project site with head up. Place on minimum 4- inch-high wood blocking. Provide minimum ¼-inch space between each stacked door to permit air circulation.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Basis of Design:

1. Steelcraft; an Ingersoll-Rand company

B. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Ceco Door Products; an Assa Abloy Group company
2. Curries Company; an Assa Abloy Group company
3. Substitutions: Under provisions of Section 012500 “Substitution Procedures”.

C. Source Limitations: Obtain hollow-metal work from single source from single manufacturer.

2.2 REGULATORY REQUIREMENTS

A. Fire-Rated, Borrowed-Light Assemblies: Complying with NFPA 80 and listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction for fire-protection ratings indicated, based on testing according to NFPA 257 or UL 9.

2.3 EXTERIOR HOLLOW-METAL DOORS AND FRAMES

A. Construct exterior frames to comply with the standards indicated for materials, fabrication, hardware locations, hardware reinforcement, tolerances, and clearances, and as specified.

B. Maximum-Duty Doors and Frames: SDI A250.8, Level 4.

1. Physical Performance: Level A according to SDI A250.4.
2. Doors:

    a. Type: As indicated in the Door and Frame Schedule.
    b. Thickness: 1¾ inches.
    c. Face: Metallic-coated steel sheet, minimum thickness of 0.067 inch, with minimum A40 coating.
    d. Edge Construction: Model 2, Seamless.
    e. Core: Vertical steel stiffener.

3. Frames:

    a. Materials: Metallic-coated steel sheet, minimum thickness of 0.067 inch, with minimum A40 coating.
    b. Construction: Face welded.

4. Exposed Finish: Prime.

2.4 FRAME ANCHORS

A. Jamb Anchors:

1. Masonry Type: Adjustable strap-and-stirrup or T-shaped anchors to suit frame size, not less than 0.042 inch thick, with corrugated or perforated straps not less than 2 inches wide by 10 inches long; or wire anchors not less than 0.177 inch thick.
2. Stud-Wall Type: Designed to engage stud, welded to back of frames; not less than 0.042 inch thick.
3. Postinstalled Expansion Type for In-Place Concrete or Masonry: Minimum 3/8-inch- diameter bolts with expansion shields or inserts. Provide pipe spacer from frame to wall, with throat reinforcement plate, welded to frame at each anchor location.

B. Floor Anchors: Formed from same material as frames, minimum thickness of 0.042 inch, and as follows:

1. Monolithic Concrete Slabs: Clip-type anchors, with two (2) holes to receive fasteners.

2.5 MATERIALS

A. Cold-Rolled Steel Sheet: ASTM A 1008, Commercial Steel (CS), Type B; suitable for exposed applications.

B. Metallic-Coated Steel Sheet: ASTM A 653, Commercial Steel (CS), Type B.

C. Frame Anchors: ASTM A 879, Commercial Steel (CS), 04Z coating designation; mill phosphatized.

D. Inserts, Bolts, and Fasteners: Hot-dip galvanized according to ASTM A 153.

E. Power-Actuated Fasteners in Concrete: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with clips or other accessory devices for attaching hollow-metal frames of type indicated.

F. Grout: ASTM C 476, except with a maximum slump of 4 inches, as measured according to ASTM C 143.

G. Mineral-Fiber Insulation: ASTM C 665, Type I (blankets without membrane facing); consisting of fibers manufactured from slag or rock wool; with maximum flame-spread and smoke developed indexes of 25 and 50, respectively; passing ASTM E 136 for combustion characteristics.

H. Glazing: Comply with requirements in Section 088000 “Glazing”.

I. Bituminous Coating: Cold-applied asphalt mastic, compounded for 15-mil dry film thickness per coat. Provide inert-type noncorrosive compound free of asbestos fibers, sulfur components, and other deleterious impurities.

2.6 FABRICATION

A. Fabricate hollow-metal work to be rigid and free of defects, warp, or buckle. Accurately form metal to required sizes and profiles, with minimum radius for metal thickness. Where practical, fit and assemble units in manufacturer's plant. To ensure proper assembly at Project site, clearly identify work that cannot be permanently factory assembled before shipment.

B. Hollow-Metal Doors:

1. Steel-Stiffened Door Cores: Provide minimum thickness 0.026 inch, steel vertical stiffeners of same material as face sheets extending full-door height, with vertical webs spaced not more than 6 inches apart. Spot weld to face sheets no more than 5 inches o.c. Fill spaces between stiffeners with glass- or mineral-fiber insulation.
2. Fire Door Cores: As required to provide fire-protection ratings indicated.
3. Vertical Edges for Single-Acting Doors: Bevel edges 1/8 inch in 2 inches.
4. Top Edge Closures: Close top edges of doors with flush closures of same material as face sheets.
5. Bottom Edge Closures: Close bottom edges of doors with end closures or channels of same material as face sheets.
6. Exterior Doors: Provide weep-hole openings in bottoms of exterior doors to permit moisture to escape. Seal joints in top edges of doors against water penetration.
7. Astragals: Provide overlapping astragal on one (1) leaf of pairs of doors where required by NFPA 80 for fire-performance rating or where indicated. Extend minimum ¾ inch beyond edge of door on which astragal is mounted or as required to comply with published listing of qualified testing agency.

C. Hollow-Metal Frames: Where frames are fabricated in sections due to shipping or handling limitations, provide alignment plates or angles at each joint, fabricated of same thickness metal as frames.

1. Sidelite and Transom Bar Frames: Provide closed tubular members with no visible face seams or joints, fabricated from same material as door frame. Fasten members at crossings and to jambs by butt welding.
2. Provide countersunk, flat- or oval-head exposed screws and bolts for exposed fasteners unless otherwise indicated.
3. Grout Guards: Weld guards to frame at back of hardware mortises in frames to be grouted.
4. Floor Anchors: Weld anchors to bottoms of jambs with at least four (4) spot welds per anchor; however, for slip-on drywall frames, provide anchor clips or countersunk holes at bottoms of jambs.
5. Jamb Anchors: Provide number and spacing of anchors as follows:

    a. Masonry Type: Locate anchors not more than 16 inches from top and bottom of frame. Space anchors not more than 32 inches o.c., to match coursing, and as follows:

        1) Two (2) anchors per jamb up to 60 inches high.
        2) Three (3) anchors per jamb from 60 to 90 inches high.
        3) Four (4) anchors per jamb from 90 to 120 inches high.
        4) Four (4) anchors per jamb plus one (1) additional anchor per jamb for each 24 inches or fraction thereof above 120 inches high.

    b. Stud-Wall Type: Locate anchors not more than 18 inches from top and bottom of frame. Space anchors not more than 32 inches o.c. and as follows:

        1) Three (3) anchors per jamb up to 60 inches high.
        2) Four (4) anchors per jamb from 60 to 90 inches high.
        3) Five (5) anchors per jamb from 90 to 96 inches high.
        4) Five (5) anchors per jamb plus one (1) additional anchor per jamb for each 24 inches or fraction thereof above 96 inches high.

    c. Postinstalled Expansion Type: Locate anchors not more than 6 inches from top and bottom of frame. Space anchors not more than 26 inches o.c.

6. Door Silencers: Except on weather-stripped frames, drill stops to receive door silencers as follows. Keep holes clear during construction.

    a. Single-Door Frames: Drill stop in strike jamb to receive three (3) door silencers.

D. Fabricate concealed stiffeners and edge channels from either cold- or hot-rolled steel sheet.

E. Hardware Preparation: Factory prepare hollow-metal work to receive templated mortised hardware; include cutouts, reinforcement, mortising, drilling, and tapping according to SDI A250.6, the Door Hardware Schedule, and templates.

1. Reinforce frames to receive non-templated, mortised, and surface-mounted door hardware.
2. Comply with applicable requirements in SDI A250.6 and BHMA A156.115 for preparation of hollow-metal work for hardware.

F. Stops and Moldings: Provide stops and moldings around glazed lites and louvers where indicated. Form corners of stops and moldings with mitered hairline joints.

1. Single Glazed Lites: Provide fixed stops and moldings welded on secure side of hollow- metal work.
2. Provide fixed frame moldings on secure side of interior doors.
3. Provide loose stops and moldings on inside of hollow-metal work.
4. Coordinate rabbet width between fixed and removable stops with glazing and installation types indicated.

2.7 STEEL FINISHES

A. Prime Finish: Clean, pretreat, and apply manufacturer's standard primer.

1. Shop Primer: Manufacturer's standard, fast-curing, lead- and chromate-free primer complying with SDI A250.10; recommended by primer manufacturer for substrate; compatible with substrate and

field-applied coatings despite prolonged exposure.

2.8 ACCESSORIES

A. Mullions and Transom Bars: Join to adjacent members by welding or rigid mechanical anchors.

B. Grout Guards: Formed from same material as frames, not less than 0.016 inch thick.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Examine roughing-in for embedded and built-in anchors to verify actual locations before frame installation.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Remove welded-in shipping spreaders installed at factory. Restore exposed finish by grinding, filling, and dressing, as required to make repaired area smooth, flush, and invisible on exposed faces.

B. Drill and tap doors and frames to receive nontemplated, mortised, and surface-mounted door hardware.

3.3 INSTALLATION

A. General: Install hollow-metal work plumb, rigid, properly aligned, and securely fastened in place. Comply with Drawings and manufacturer's written instructions.

B. Hollow-Metal Frames: Install hollow-metal frames for doors, transoms, sidelites, borrowed lites, and other openings, of size and profile indicated. Comply with SDI A250.11 or NAAMM-HMMA 840 as required by standards specified.

1. Set frames accurately in position; plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is complete, remove temporary braces, leaving surfaces smooth and undamaged.

    a. Where frames are fabricated in sections because of shipping or handling limitations, field splice at approved locations by welding face joint continuously; grind, fill, dress, and make splice smooth, flush, and invisible on exposed faces.
    b. Install frames with removable stops located on secure side of opening.
    c. Install door silencers in frames before grouting.
    d. Remove temporary braces necessary for installation only after frames have been properly set and secured.
    e. Check plumb, square, and twist of frames as walls are constructed. Shim as necessary to comply with installation tolerances.
    f. Field apply bituminous coating to backs of frames that will be filled with grout containing antifreezing agents.

2. Floor Anchors: Provide floor anchors for each jamb and mullion that extends to floor, and secure with postinstalled expansion anchors.

    a. Floor anchors may be set with power-actuated fasteners instead of postinstalled expansion anchors if so indicated and approved on Shop Drawings.

3. In-Place Concrete Construction: Secure frames in place with postinstalled expansion anchors. Countersink anchors, and fill and make smooth, flush, and

invisible on exposed faces.

4. Installation Tolerances: Adjust hollow-metal door frames for squareness, alignment, twist, and plumb to the following tolerances:

    a. Squareness: Plus or minus 1/16 inch, measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.
    b. Alignment: Plus or minus 1/16 inch, measured at jambs on a horizontal line parallel to plane of wall.
    c. Twist: Plus or minus 1/16 inch, measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.
    d. Plumbness: Plus or minus 1/16 inch, measured at jambs at floor.

C. Hollow-Metal Doors: Fit hollow-metal doors accurately in frames, within clearances specified below. Shim as necessary.

1. Non-Fire-Rated Steel Doors:

    a. Between Door and Frame Jambs and Head: 1/8 inch plus or minus 1/32 inch.
    b. Between Edges of Pairs of Doors: 1/8 inch to ¼ inch plus or minus 1/32 inch.
    c. At Bottom of Door: ¾ inch.
    d. Between Door Face and Stop: 1/16 inch to 1/8 inch plus or minus 1/32 inch.

2. Fire-Rated Doors: Install doors with clearances according to NFPA 80.
3. Smoke-Control Doors: Install doors and gaskets according to NFPA 105.

D. Glazing: Comply with installation requirements in Section 088000 "Glazing" and with hollow- metal manufacturer's written instructions.

1. Secure stops with countersunk flat- or oval-head machine screws spaced uniformly not more than 9 inches o.c. and not more than 2 inches o.c. from each corner.

3.4 ADJUSTING AND CLEANING

A. Final Adjustments: Check and readjust operating hardware items immediately before final inspection. Leave work in complete and proper operating condition. Remove and replace defective work, including hollow-metal work that is warped, bowed, or otherwise unacceptable.
B. Remove grout and other bonding material from hollow-metal work immediately after installation.
C. Prime-Coat Touchup: Immediately after erection, sand smooth rusted or damaged areas of prime coat and apply touchup of compatible air-drying, rust-inhibitive primer.
D. Metallic-Coated Surface Touchup: Clean abraded areas and repair with galvanizing repair paint according to manufacturer's written instructions.

END OF SECTION 08 11 13

SECTION 08 36 13
SECTIONAL DOORS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes electrically operated sectional doors.

B. Related Sections:

1. Section 05500 "Metal Fabrications" for miscellaneous steel supports.
2. Division 16 Sections for electrical service and connections for powered operators and accessories.

1.3 ACTION SUBMITTALS

A. Product Data: For each type and size of sectional door and accessory.

1. Include construction details, material descriptions, dimensions of individual components, profile door sections, and finishes.
2. Include rated capacities, operating characteristics, electrical characteristics, and furnished accessories.

B. Shop Drawings: For each installation and for special components not dimensioned or detailed in manufacturer's product data.

1. Include plans, elevations, sections, details, and attachments to other work.
2. Include details of equipment assemblies. Indicate dimensions, required clearances, method of field assembly, components, and location and size of each field connection.
3. Include points of attachment and their corresponding static and dynamic loads imposed on structure.
4. Include diagrams for power, signal, and control wiring.

C. Samples: For units with factory-applied finishes.

1. Include Samples of accessories involving color selection.

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

B. Sample Warranties: For special warranties.

1.5 CLOSEOUT SUBMITTALS

A. Maintenance Data: For sectional doors to include in maintenance manuals.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for both installation and maintenance of units required for this Project.

B. Regulatory Requirements: Comply with applicable provisions in the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines and ICC A117.1.

1.7 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace components of sectional doors that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Structural failures including, but not limited to, excessive deflection.
b. Failure of components or operators before reaching required number of operation cycles.
c. Faulty operation of hardware.
d. Deterioration of metals, metal finishes, and other materials beyond normal weathering and use; rust through.
e. Delamination of exterior or interior facing materials.

2. Warranty Period: Two (2) years from date of Substantial Completion.

B. Special Finish Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components that show evidence of deterioration of factory-applied finishes within specified warranty period.

1. Warranty Period: Ten (10) years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS, GENERAL

A. Source Limitations: Obtain sectional doors from single source from single manufacturer.

1. Obtain operators and controls from sectional door manufacturer.

2.2 PERFORMANCE REQUIREMENTS

A. General Performance: Sectional doors shall meet performance requirements specified without failure due to defective manufacture, fabrication, installation, or other defects in construction and without requiring temporary installation of reinforcing components.

B. Structural Performance, Exterior Doors: Capable of withstanding the design wind loads.

1. Design Wind Load: As indicated on Drawings.
2. Testing: According to ASTM E 330.
3. Deflection Limits: Design sectional doors to withstand design wind loads without evidencing permanent deformation or disengagement of door components.

a. Deflection of door in horizontal position (open) shall not exceed 1/120 of the door width.
b. Deflection of horizontal track assembly shall not exceed 1/240 of the door height.

2.3 DOOR ASSEMBLY

A. Steel Sectional Door: Sectional door formed with hinged sections.

1. Basis-of-Design Product:

a. Overhead Door Corporation; **Thermacore 596**

2. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

a. Clopay Building Products; a Griffon company
b. Raynor
c. Wayne-Dalton Corp.
d. Substitutions: Under provisions of Section 012500 “Substitution Procedures”.

B. Operation Cycles: Door components and operators capable of operating for not less than one hundred thousand (100,000). One (1) operation cycle is complete when a door is opened from the closed position to the fully open position and returned to the closed position.

C. Air Infiltration: Maximum rate of 0.08 cfm/sq. ft. at 15 and 25 mph when tested according to ASTM E 283 or DASMA 105.

D. Installed R-Value: 17.5 deg F x h x sq. ft./Btu.

E. Steel Sections: Zinc-coated (galvanized) steel sheet with G90 zinc coating.

1. Section Thickness: 2 inches.

2. Face, Steel Sheet Thickness: 20-gauge nominal coated thickness.

   a. Surface: Manufacturer's standard, flush.

3. Insulation: Board.
4. Hinges: Double End.

F. Track Configuration: Custom-lift track to slope parallel with roof structure; **3-inch Heavy Duty Track**.

G. Weatherseals: Fitted to bottom and top and around entire perimeter of door. Provide combination bottom weatherseal and sensor edge.

A. Windows: Size as indicated on Drawings, with square corners, in rows as indicated on Drawings; installed with insulated glazing of the following type:

1. Insulating Glass: Manufacturer's standard insulated double-strength glass.

B. Roller-Tire Material: Case-hardened steel.

C. Locking Devices: Equip door with slide bolt for padlock and chain lock keeper.

D. Counterbalance Type: Torsion spring.

E. Electric Door Operator:

1. Usage Classification: Standard duty, up to sixty (60) cycles per hour.
2. Operator Type: Jackshaft, side mounted.
3. Safety: Listed according to UL 325 by a qualified testing agency for commercial or industrial use; moving parts of operator enclosed or guarded if exposed and mounted at 8 feet or lower.
4. Motor Exposure: Interior, clean, and dry.
5. Emergency Manual Operation: Cable type to align with window mullions.
6. Obstruction-Detection Device: Automatic photoelectric sensor and electric sensor edge on bottom bar; self-monitoring type.

   a. Sensor Edge Bulb Color: Black.

7. Control Station: Interior.
8. Other Equipment: Audible and visual signals and radio-control system.
9. Timer/Controller: Control interface device to open and closet doors in response to DPW Electronic Notification from Trucks
   a. Override Switch: Provide to override automatic closing..

F. Door Finish:

1. Baked-Enamel or Powder-Coat Finish: Color and gloss as selected by Architect and Owner from manufacturer's full range.
2. Finish of Interior Facing Material: Manufacturer's standard, white.

2.2 MATERIALS, GENERAL

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.

2.3 STEEL DOOR SECTIONS

A. Exterior Section Faces and Frames: Fabricate from zinc-coated (galvanized), cold-rolled, commercial steel (CS) sheet, complying with ASTM A 653, with indicated zinc coating and thickness.

1. Fabricate section faces from single sheets to provide sections not more than 24 inches high and of indicated thickness. Roll horizontal meeting edges to a continuous, interlocking, keyed, rabbeted, shiplap, or tongue-in-groove weathertight seal, with a reinforcing flange return.

2. For insulated doors, provide sections with continuous thermal-break construction, separating the exterior and interior faces of door.

H. Section Ends and Intermediate Stiles: Enclose open ends of sections with channel end stiles formed from galvanized-steel sheet not less than 0.064-inch-nominal coated thickness and welded to door section. Provide intermediate stiles formed from not less than 0.064-inch-thick galvanized-steel sheet, cut to door section profile, and welded in place. Space stiles not more than 48 inches apart.

I. Reinforce bottom section with a continuous channel or angle conforming to bottom-section profile.

J. Reinforce sections with continuous horizontal and diagonal reinforcement, as required to stiffen door and for wind loading. Provide galvanized-steel bars, struts, trusses, or strip steel, formed to depth and bolted or welded in place. Ensure that reinforcement does not obstruct vision lites.

K. Provide reinforcement for hardware attachment.

L. Board Thermal Insulation: Insulate interior of steel sections with door manufacturer's standard CFC-free polystyrene or polyurethane board insulation, with maximum flame-spread and smoke- developed indexes of 75 and 450, respectively, according to ASTM E 84; or with glass-fiber- board insulation. Secure insulation to exterior face sheet. Enclose

insulation completely within steel sections that incorporate the following interior facing material, with no exposed insulation:

M. Interior Facing Material: Zinc-coated (galvanized), cold-rolled, commercial steel (CS) sheet, complying with ASTM A 653, with indicated thickness.

N. Fabricate sections so finished door assembly is rigid and aligned, with tight hairline joints and free of warp, twist, and deformation.

2.4 TRACKS, SUPPORTS, AND ACCESSORIES

A. Tracks: Manufacturer's standard, galvanized-steel track system of configuration indicated, sized for door size and weight, designed for lift type indicated and clearances shown on Drawings. Provide complete system including brackets, bracing, and reinforcement for rigid support of ball-bearing roller guides for required door type, size, weight, and loading.

1. Galvanized Steel: ASTM A 653, minimum G60 zinc coating.
2. Slope tracks at an angle from vertical or design tracks to ensure tight closure at jambs when door unit is closed.
3. Track Reinforcement and Supports: Galvanized-steel members to support track without sag, sway, and vibration during opening and closing of doors. Slot vertical sections of track spaced 2 inches apart for door-drop safety device.

    a. Vertical Track Assembly: Continuous reinforcing angle attached to track and attached to wall with jamb brackets.
    b. Horizontal Track Assembly: Continuous reinforcing angle from curve in track to end of track, attached to track and supported at points by laterally braced attachments to overhead structural members

B. Weatherseals: Replaceable, adjustable, continuous, compressible weather-stripping gaskets of flexible vinyl, rubber, or neoprene fitted to bottom and top of sectional door unless otherwise indicated.

C. Windows: Manufacturer's standard window units of type and size indicated and in arrangement shown. Set glazing in vinyl, rubber, or neoprene glazing channel for metal-framed doors, as required. Provide removable stops of same material as door-section frames.

2.5 HARDWARE

A. General: Provide heavy-duty, corrosion-resistant hardware, with hot-dip galvanized, stainless- steel, or other corrosion-resistant fasteners, to suit door type.

B. Hinges: Heavy-duty, galvanized-steel hinges of not less than 0.079-inch-nominal coated thickness at each end stile and at each intermediate stile, according to manufacturer's written recommendations for door size. Attach hinges to door sections through stiles and rails with bolts and lock nuts or lock washers and nuts. Use rivets or self-tapping fasteners where access to nuts is not possible. Provide double-end hinges where required, for doors over 16

feet wide unless otherwise recommended by door manufacturer.

C. Rollers: Heavy-duty rollers with steel ball-bearings in case-hardened steel races, mounted with varying projections to suit slope of track. Extend roller shaft through both hinges where double hinges are required. Provide 3-inch-diameter roller tires for 3-inch-wide track and 2-inch- diameter roller tires for 2-inch-wide track.

D. Push/Pull Handles: For push-up or emergency-operated doors, provide galvanized-steel lifting handles on each side of door.

2.6 LOCKINGDEVICES

A. Slide Bolt: Fabricate with side-locking bolts to engage through slots in tracks, located on single-jamb side, operable from inside only.

B. Chain Lock Keeper: Suitable for padlock.

C. Safety Interlock Switch: Equip power-operated doors with safety interlock switch to disengage power supply when door is locked.

2.7 COUNTERBALANCE MECHANISM

A. Torsion Spring: Counterbalance mechanism consisting of adjustable-tension torsion springs fabricated from steel-spring wire complying with ASTM A 229, mounted on torsion shaft made of steel tube or solid steel. Provide springs designed for number of operation cycles indicated.

B. Cable Drums and Shaft for Doors: Cast-aluminum or gray-iron casting cable drums mounted on torsion shaft and grooved to receive door-lifting cables as door is raised. Mount counterbalance mechanism with manufacturer's standard ball-bearing brackets at each end of torsion shaft. Provide one (1) additional midpoint bracket for shafts up to 16 feet long and two (2) additional brackets at one-third points to support shafts more than 16 feet long unless closer spacing is recommended by door manufacturer.

C. Cables: Galvanized-steel lifting cables with cable safety factor of at least five (5) to one (1).

D. Cable Safety Device: Include a spring-loaded steel or spring-loaded bronze cam mounted to bottom door roller assembly on each side and designed to automatically stop door if either lifting cable breaks.

E. Bracket: Provide anchor support bracket as required to connect stationary end of spring to the wall and to level the shaft and prevent sag.

F. Bumper: Provide spring bumper at each horizontal track to cushion door at end of opening operation.

2.8 ELECTRIC DOOR OPERATORS

A. General: Electric door operator assembly of size and capacity recommended and provided by door manufacturer for door and "operation cycles" requirement specified, with electric motor and factory-prewired motor controls, starter, gear-reduction unit, solenoid-operated brake, clutch, remote-control stations, control devices, integral gearing for locking door, and accessories required for proper operation.

1. Comply with NFPA 70.
2. Provide control equipment complying with NEMA ICS 1, NEMA ICS 2, and NEMA ICS 6; with NFPA 70, Class 2 control circuit, maximum 24-V ac or dc.

B. Usage Classification: Electric operator and components capable of operating for not less than number of cycles per hour indicated for each door.

C. Door-Operator Type: Unit consisting of electric motor, gears, pulleys, belts, sprockets, chains, and controls needed to operate door and meet required usage classification.

1. Heavy Duty Sectional Door Operator: Model RHX True Gear Head Type Door Operator:
2. Lift Clearance Sectional Door

D. Electric Motors: Comply with NEMA designation, temperature rating, service factor, enclosure type, and efficiency requirements unless otherwise indicated.

1. Electrical Characteristics:

a. Phase: Single phase.
b. Volts: 120 V.
c. Hertz: 60.

2. Motor Type and Controller: Reversible motor and controller (disconnect switch) for motor exposure indicated.
3. Motor Size: Minimum 1 HP but sized large enough to start, accelerate, and operate door in either direction from any position, at a speed not less than 8 in./sec. and not more than 12 in./sec., without exceeding nameplate ratings or service factor.

4. Operating Controls, Controllers (Disconnect Switches), Wiring Devices, and Wiring:
Manufacturer's standard unless otherwise indicated.
5. Coordinate wiring requirements and electrical characteristics of motors and other electrical devices with building electrical system and each location where installed.
6. Use adjustable motor-mounting bases for belt-driven operators.

E. Limit Switches: Equip each motorized door with adjustable switches interlocked with motor controls and set to automatically stop door at fully opened and fully closed

positions.

F. Obstruction Detection Device: Equip motorized door with indicated external automatic safety sensor capable of protecting full width of door opening. Activation of device immediately stops and reverses downward door travel.

1. Photoelectric Sensor: Manufacturer's standard system designed to detect an obstruction in door opening without contact between door and obstruction.

a. Self-Monitoring Type: Designed to interface with door operator control circuit to detect damage to or disconnection of sensor device. When self-monitoring feature is activated, door closes only with sustained pressure on close button.

2. Sensor Edge: Automatic safety sensor edge, located within astragal or weather stripping mounted to bottom bar. Contact with sensor activates device. Connect to control circuit using manufacturer's standard take-up reel or self-coiling cable.

a. Self-Monitoring Type: Two-wire configured device designed to interface with door- operator control circuit to detect damage to or disconnection of sensor edge.

G. Control Station: Three-button control station in fixed location with momentary-contact push- button controls labeled "Open" and "Stop" and sustained- or constant-pressure, push-button control labeled "Close."

1. Interior units, full-guarded, surface-mounted, heavy-duty type, with general-purpose NEMA ICS 6, Type 1 enclosure. Provide with wiring, circuitry and raceways as required.

H. Emergency Manual Operation: Equip each electrically powered door with capability for emergency manual operation. Design manual mechanism so required force for door operation does not exceed 25 lbf.

I. Emergency Operation Disconnect Device: Equip operator with hand-operated disconnect mechanism for automatically engaging manual operator and releasing brake for emergency manual operation while disconnecting motor without affecting timing of limit switch. Mount mechanism so it is accessible from floor level. Include interlock device to automatically prevent motor from operating when emergency operator is engaged.

J. Motor Removal: Design operator so motor may be removed without disturbing limit-switch adjustment and without affecting emergency manual operation.

K. Audible and Visual Signals: Audible alarm and visual indicator lights in compliance with regulatory requirements for accessibility. Mount signals on interior of building only.

L. Portable, Radio-Control System: Consisting of the following:

1. Three-channel universal coaxial receiver to open, close, and stop door. Provide one (1) transmitter for each door for each vehicle.

2.9 GENERAL FINISH REQUIREMENTS

A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

B. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

2.10 STEEL AND GALVANIZED-STEEL FINISHES

A. Baked-Enamel Finish: Manufacturer's standard baked-on finish consisting of prime coat and thermosetting topcoat. Comply with coating manufacturer's written instructions for cleaning, pretreatment, application, and minimum dry film thickness.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for substrate construction and other conditions affecting performance of the Work.

B. Examine locations of electrical connections.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Install sectional doors and operating equipment complete with necessary hardware, anchors, inserts, hangers, and equipment supports; according to manufacturer's written instructions and as specified.

B. Tracks:

1. Fasten vertical track assembly to opening jambs and framing, spaced not more than 24 inches apart.

2. Hang horizontal track assembly from structural overhead framing with angles or channel hangers attached to framing by welding or bolting, or both. Provide sway bracing, diagonal bracing, and reinforcement as required for rigid installation of track and door- operating equipment.
3. Repair galvanized coating on tracks according to ASTM A 780.

C. Accessibility: Install sectional doors, switches, and controls along accessible routes in compliance with regulatory requirements for accessibility.

D. Power-Operated Doors: Install according to UL 325.

3.3 STARTUP SERVICES

A. Engage a factory-authorized service representative to perform startup service.

1. Complete installation and startup checks according to manufacturer's written instructions.
2. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

3.4 ADJUSTING

A. Adjust hardware and moving parts to function smoothly so that doors operate easily, free of warp, twist, or distortion.

B. Lubricate bearings and sliding parts as recommended by manufacturer.

C. Adjust doors and seals to provide weathertight fit around entire perimeter.

D. Touch-up Painting: Immediately after welding galvanized materials, clean welds and abraded galvanized surfaces and repair galvanizing to comply with ASTM A 780.

3.5 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain sectional doors.

END OF SECTION 08 36 13

SECTION 08 71 00
DOOR HARDWARE

SECTION 08700- DOOR

HARDWARE PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 WORK INCLUDES

A. Base Bid:

1. General Contractor to provide finish hardware as indicated on the hardware schedule and specified herein.

1.3 REFERENCES

A. ANSI A117.1 -Specifications for Making Buildings and Facilities Accessible to and Usable by Physically Handicapped People.

B. ANSI/NFPA 80 - Fire Doors and Windows.

C. AWI - Architectural Woodwork Institute.

D. BHMA - Builders' Hardware Manufacturers Association.

E. DHI - Door and Hardware Institute.

F. NAAMM - National Association of Architectural Metal Manufacturers.

G. NFPA 101 - Life Safety Code.

H. SDI - Steel Door Institute.

1.4 COORDINATION:

A. Coordinate work of this Section with other directly affected Sections involving manufacturer of any internal reinforcement for door hardware.

1.5 QUALITY ASSURANCE

A. Manufacturers: Companies specializing in manufacturing door hardware with minimum 3 years experience.

B. Hardware Supplier: Company specializing in supplying commercial door hardware with 2 years experience, with AHC designation.

C. Hardware Installer: Employ a qualified carpentry person to perform the work of this Section.

D. Manufacturers: Items of manufacturers other than those scheduled will be acceptable

for substitution provided they meet the quality standards of this Specification for finish, function and grade. For the purpose of establishing quality standards and design, only one manufacturer of each type of hardware has been scheduled.

1.6 SUBMITTALS

A. Submit schedule, shop drawings, and product data under provisions of Section 01340.

B. Indicate locations and mounting heights of each type of hardware.

C. Provide product data on specified hardware.

1.7 OPERATION AND MAINTENANCE DATA

A. Submit operation and maintenance data under provisions of Section 01730.

B. Include data on operating hardware, lubrication requirements, and inspection procedures related to preventative maintenance.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Store and protect products under provisions of Section 01620.

B. Package hardware items individually; label and identify package with door opening code to match hardware schedule.

C. Deliver permanent keys to Owner direct from hardware supplier.

D. Protect hardware from theft by cataloging and storing in secure area.

1.9 MAINTENANCE MATERIALS

A. Provide special wrenches and tools applicable to each different or special hardware component.

B. Provide maintenance tools and accessories supplied by hardware component manufacturer.

PART 2 PRODUCTS

2.1 GENERAL

A. Fasteners: Hardware shall be complete with all necessary screws, bolts, anchors or other fasteners for proper application. Such fasteners shall be of suitable size and type, and shall harmonize with hardware as to materials and finish.

B. Door Closers: Closers shall not be installed on the outside of any exterior door. Whenever it is necessary to install a closer on the side of the door away from the butts, a parallel arm shall be used. Corner of soffit brackets are not permitted unless no other method of installation is possible. All closers shall be fastened with through bolts and grommet nuts.

2.2 KEYING. Furnish 2 key blanks for each lock specified plus ten additional blanks to be used as master keys.

2.3 FINISHES: All hardware to be (BHMA 630) Stain Stainless Steel, except as noted.

2.4 HINGES

A. Description:
1. 4-1/2" x 4-1/2" at doors not more than 36" wide
2. 5" x 4-1/2" at doors more than 36" wide.
3. Non-removable pins at exterior locations

B. Acceptable Manufacturers:

1. Type 1 (ball bearing) at doors with closers:
   a. Hager BB1279
   b. Stanley FBB179
2. Type 2 (non-ball bearing) at doors without closers
   a. Hager 1279
   b. Stanley F179
3. Type 3 (ball-bearing) heavy weight hinges
   a. Hager BB1168
   b. Stanley FBB168

2.5 CLOSER

A. Description: Unless called out to be otherwise, mount on face of door on push side; with hold- open and delayed action features.

B. Acceptable manufacturers
1. N
orton
7500
5.
LCN
4041
6. Corbin Russwin DC2200/DC2210

2.6 LOCK/LATCH

A. Description:
1. Handicapped accessible lever design
2. 2-3/4" backset typical.

B. Acceptable Manufacturers:
1. Office Function: Mortise (Keyed)
   a. Corbin Russwin - #ML2051 (ANSI F04)
   b. Sargent - 8200 Series - #55 Office (ANSI F04)
   c. Schlage - #L9050 (ANSI F04)

2. Exterior Door: Rim Exit Device (Keyed)
    a. Corbin Russwin - #ED 4200 (Classroom Function) (ANSI 06)
    b. Sargent - 8500 Series - #13 (ANSI 08)
    c. Schlage - 25-R Series 25-R-L
3. Lever Design
    a. Corbin Russwin - Newport
    b. Sargent - “L” Lever
    c. Schlage - Standard Levers “06"

2.7 KICKPLATES

A. Construction:
    1. 10" high x width of door 2. .050", 18 ga.
    3. Place on kick side of scheduled doors
    4. Finish - US32D

B. Acceptable Manufacturers:
    1. Hager - 190S CSK

2.8 THRESHOLD

A. ADA Compliant aluminum threshold with vinyl bumper seal, ½" maximum overall height, widths and lengths to fit specific opening conditions.

END OF SECTION 08 71 00

SECTION 13 34 18
POST FRAME BUILDING SYSTEM

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Pre-Engineered factory and field fabricated Timber Column Structure
B. Prefinished metal roofing and siding panels
C. Prefinished metal trim items
D. Prefinished soffits
E. Prefinished gutters and downspouts
F. Interior Liner Package

1.04 REFERENCE STANDARDS

A. Building Design Standards
1. 2022 International Building Code

2. American Society of Civil Engineers; ASCE-7-XX Minimum Design Loads and Associated Criteria for Buildings and Other Structures

3. American Wood Council (AWC)
a. National Design Specification (2024 NDS) for Wood Construction

B. Preservative Treated Lumber
1. American Wood Protection Association (AWPA)
a. 2024AWPA Book of Standards
i. Use Category System U1, User Specification for Treated Wood
ii. UC4A, Important Structural - Ground Contact
iii. UC4B, Structural Support - Ground Contact

2. International Code Council - Evaluation Service Report 2240
a. Micronized Copper Azole preservative-treated lumber

C. Pre-cast Concrete / Cast-In-Place Concrete
1. American Concrete Institute (ACI)
a. ACI 318-XX Building Code Requirements for Structural Concrete

D. Framing Lumber
1. National Design Specification for Wood Construction (2024 NDS)

2. Southern Pine Inspection Bureau (SPIB)

a. 2021 Standard Grading Rules for Southern Pine Lumber

3. National Lumber Grades Authority (NLGA)
a. 2022 National Lumber Grades Authority Standard Grading Rules for Canadian Lumber

E. Wood Trusses
1. Truss Plate Institute (ANSI / TPI-1 - 2022 National Design Standard for Metal Plate Connected Wood Truss Construction)
a. Design, engineering, and quality control requirements for manufactured wood trusses

1.05 SYSTEM DESCRIPTION

A. Post-Frame Construction
1. Clear span

2. Primary Framing
a. Columns
b. Trusses
c. Lateral bracing

3. Secondary framing
a. Perimeter baseboards / preservative-treated
b. Wall girts (nailers)
c. Purlins
d. Overhang rafters and fascia
e. Ancillary blocking or furring as required

4. Roof Covering
a. Prefinished ribbed metal panels
b. Other roof coverings as required

5. Wall Covering
a. Prefinished ribbed metal panels
b. Other wall coverings as required

6. Insulation and Liner Package
a. Wall insulation
b. Ceiling insulation
c. Air deflectors
d. Vapor retarder
e. Wall stripping
f. Prefinished ribbed metal panels

1.06 DESIGN REQUIREMENTS

See Section 018000 Performance Standards

1.07 SUBMITTALS

A. Provide 3 sets of the following bearing the seal of a Professional Engineer, registered in the State of Connecticut.

1. Complete and detailed shop and erection drawings showing size and location of each part and component, certifying that the building design meets specified roof and wind loading requirements

2. Truss engineering analysis and design data, including the following
   a. Axial forces and bending moments for each member
   b. Basic plate design value
   c. Design analysis of each joint showing that proper plates have been applied

3. Manufacturer's metal panel standard color chart

1.08 PROJECT RECORD DOCUMENTS

A. Submit to the Owner

1.09 QUALITY ASSURANCE

A. Truss Assembly Quality

1. Manufacturer shall provide evidence of compliance with quality control requirements of TPI-1 - 2022

2. Trusses shall be stamped to indicate quality assurance auditing by an independent agency

B. Prefinished Ribbed Metal Panels

1. Manufacturer shall provide evidence of compliance with UL2218 and UL790 (Hail impact and external fire resistance, respectively) for roofing panels.
   a. Prefinished Ribbed Metal Panels to be applied as roofing shall be delivered with a certificate to indicate compliance with UL2218 Class 4 and UL790 Class A

C. Other Manufacturer Certifications and Approvals as Required

1.10 QUALIFICATIONS

A. Contractor shall have a minimum of twenty five years documented experience in the manufacture and erection of this type of structure.

B. Contractor shall present evidence of written procedures to describe how components are to be assembled during erection of the structure.

C. Design of structural components shall be performed under the direct supervision of a Professional Engineer experienced in design of this type of structure and licensed in the state where the project is located.

D. The Contractor shall employ adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and methods needed for proper and safe performance of the work.

E. Contractor shall be responsible for proper storage of all materials, including subcontractors' materials

1.11 REGULATORY REQUIREMENTS

A. Contractor shall be responsible for compliance with all applicable building codes and ordinances covering the work.

B. Contractor shall cooperate with regulatory agencies or authorities to provide data as requested.

1.12 PRE-CONSTRUCTION MEETING

A. The contractor shall convene a meeting no later than one week prior to commencing work.

B. The meeting shall include owner(s), contractors and subcontractors.

C. The meeting's agenda shall include a review of the project, responsibilities, timing and coordination required of contractor and subcontractors, safety plans and other information pertinent to the project.

1.13 FIELD MEASUREMENTS

A. Field measurements shall be taken to verify that components match shop drawings.

1.14 DELIVERY, STORAGE AND HANDLING

A. The contractor shall deliver and store prefabricated components (trusses, columns, steel panels and other materials) to ensure that they will not be damaged or deformed.
B. The contractor shall be responsible to stack materials on platforms, pallets or other structures covered with tarpaulins or other suitable weather-tight ventilated covering. The

contractor shall additionally handle and store structural parts in a manner that will avoid deforming members or subjecting parts to excessive stresses.

C. The contractor shall store roofing and siding panels to allow water to drain feely.

D. The contractor shall not store panels in contact with other materials that could cause corrosion, discoloration, or staining.

1.15 PROJECT CONDITIONS

A. Contractor shall coordinate the work with other trades.

B. Contractor shall fit carpentry work to other work. Scribe and cope as required for accurate fitting.

C. Contractor shall be responsible to correlate location of furring, interior stripping, blocking and supports to allow for attachment of other work.

1.16 CERTIFICATIONS

A. The bidder's proposal must include evidence that the material specifications will be met.
1. Provide written certification letter that prefinished metal panels will meet all requirements of Sections 2.03 and 2.04.

B. The bidder's proposal must include a sample warranty identical to the warranty to be issued at completion of the project.
1. The sample warranty shall verify that the warranty specification described in Section 1.17 will be met.

1.17 WARRANTY

A. The building manufacturer shall supply a warranty to the Owner which shall provide the manufacturer will meet the following requirements…

Period of Coverage	Material	Claim Conditions
50 Years	Preservative Treated Lumber	Failure due to decay or insect attack
50 Years	Building Framework Including Roofing and/or Siding Panels	Direct damage by snow loads

35 Years	Roofing and Siding Panels	Paint separation from panels
35 Years	Roofing and Siding Panels	Chalk rating less than rating of 8 (ASTM D4212) under normal weathering
35 Years	Roofing and Siding Panels	Color change greater than 5 units (ASTM D2244) under normal weathering
10 Years	Roofing and Siding Panels	Red rust corrosion greater than 1/2 inch from a sheared edge, visible in casual observation under normal weathering
5 Years	Building Framework Including Roofing and/or Siding Panels	Direct damage by wind loads unless damage is caused by flying or falling objects
5 Years	Roof Leaks	Leaks due to material or workmanship defects
1 Year	Any building part	Proven defect in material or workmanship

PART 2 PRODUCTS

2.01 MANUFACTURERS - BUILDING SYSTEM

A. Morton Buildings, Inc., Morton, Illinois

B. Other manufacturers offering similar systems
1. As approved by the owner

C. Substitutions to or deviations from these specifications
1. None

2.02 MATERIALS - FRAMING

A. Pre-Cast Concrete Pier Foundation Columns
1. Post frame building column consisting of a pre-cast concrete embedded portion with exposed rebar dowels for embedment in cast-in-place concrete footing

2. Column to have an integrated bracket for attachment to an upper wood column.

3. Column to have attachment points allowing perimeter baseboards to be structurally connected to the column.

B. Wood Column
1. Factory fabricated from minimum 3-ply No. 1 (or better) southern yellow pine lumber

2. Attach wood column to concrete column bracket with appropriate number and size of mechanically driven fasteners

3. Provide factory or field installed blocking on outside face of column between nailers

C. Wood Trusses
1. Lumber
a. Top Chord: southern yellow pine of size and grade to meet design requirements
b. Bottom Chord: southern yellow pine of size and grade to meet design requirements
c. Webs: southern yellow pine of size and grade to meet design requirements

2. Trusses shall be constructed of surfaced lumber (S4S) and compliant with SPIB visual and structural grade requirements

3. Plates: Connector plates shall meet design requirements and shall be compliant with applicable ICC-ES Report specifications

4. Design and fabricate trusses and connections to withstand snow, wind, dead, and all other loads indicated.

5. Fabricate trusses in plant, using mechanical or hydraulic fixtures as required to bring members into contact. Install plates in accordance with Truss Plate Institute TPI-1 - 2022.

D. Baseboards
1. 2”x8” nominal No. 1 southern yellow pine with 1.2” x 7/16” notch to accommodate OSB protective liner as may be required.

2. Pressure treated with wood preservative to a retention in compliance with applicable AWPA or ICC-ESR standards and specifications, and kiln dried after treatment to 19% maximum moisture content.

3. Preservative shall penetrate sapwood in compliance with AWPA or ICC-ESR standards and specifications.

E. Wall girts (nailers)
1. As required on building plans.

F. Purlins and Truss Ties
1. 2”x4” nominal No. 2 or machine stress rated spruce-pine-fir as required on building plans

G. Overhang Framing
1. Provide factory fabricated rafter frames

2. Provide 2”x6” No. 2 spruce-pine-fir factory beveled fascia boards

H. Lateral Bracing
1. 2”x6” No. 2 spruce-pine-fir factory or field cut boards to brace end wall columns with nearest available intermediate truss.

I. Framing around openings
1. 2”x4” No. 2 spruce-pine-fir around personnel doors and windows, according to building plans.

2. 2”x6” No. 2 spruce-pine-fir around overhead door openings, according to building plans.

J. Headers
1. Provide headers as required on building plans

K. Incidental Framing
1. 2”x4” and/or 2”x6” No. 2 spruce-pine-fir

L. Interior Framing
1. 2”x4” No. 2 spruce-pine-fir

2.03 MATERIALS - PREFINISHED METALS

A. Roofing / Siding / Wainscot Ribbed Building Panels
1. Panel substrate shall be 0.019” minimum thickness commercial steel sheet with G90 (zinc) metallic coating per ASTM A653 or AZ55 (aluminum / zinc alloy) metallic coating per ASTM A792.

2. The weather side of the panel shall receive a nominal two tenths (0.2) mil polyurethane primer and a nominal nine tenths (0.9) mil topcoat of 70% polyvinylidene difluoride (PVDF) resin to achieve a total nominal dry film thickness of one (1) mil.

3. The non-weather side paint system shall consist of a two coat finish with a total nominal dry film thickness of one-half (0.5) mil.

4. Color selection of roofing / siding / wainscot panels shall be from the manufacturer’s standard color chart.

B. Interior Liner Ribbed Building Panels
1. Panel substrate shall be 0.019” minimum thickness commercial steel sheet with G40 (zinc) metallic coating per ASTM A653.

2. The side of the panel facing the interior of the building shall receive a nominal two tenths (0.2) mil polyurethane primer and a nominal nine tenths (0.9) mil topcoat of polyester resin to achieve a total nominal dry film thickness of one (1) mil.

3. The wall cavity or attic facing side paint system shall consist of a two coat finish with a total nominal dry film thickness of one-half (0.5) mil.

4. Color selection of interior liner panels shall be standard white, or panels may be selected from the manufacturer's standard color chart of exterior quality ribbed building panels.

C. Metal Trim Items
1. Die-formed steel from the same quality material as the siding panels. Steel substrate thickness may vary from that of ribbed building panels.

C. Gutters and Downspouts
1. Gutters
a. K-Style rollformed gutters in 5" or 6" open widths formed from 0.030" aluminum prefinished with color-matched nominal one (1) mil 70% PVDF coating system (including primer) on exposed critical visual surfaces.
b. Interior of gutter to be coated with nominal one-half (0.5) mil paint wash coat

2. Downspouts
a. Rollformed steel from the same quality as siding panels. Steel substrate thickness may vary from that of ribbed building panels.
b. Downspouts to match standard colors
c. Downspouts to be sized to match gutter size

2.04 MATERIALS - OTHER

A. Corner bracing
1. Provide 1-1/4" wide high tensile steel strapping to be installed in all unobstructed corners in a "X" configuration

B. Roofing / Siding / Wainscot fasteners
1. Center-drive stainless steel screws with EPDM-gasketed washers for ribbed steel panels

2. Fasteners shall be painted to match selected colors

C. Interior liner fasteners
1. Center-drive carbon steel pan-head screws for ribbed steel panels, painted in standard white color, or

2. Center-drive stainless steel screws with EPDM-gasketed washers for optional exterior ribbed steel panels

D. Closure strips
1. Strips shall be made from closed cell foam

E. Sealant
1. 100% neutral curing silicone sealants shall be applied where required.

2. Paintable sealant shall be applied where required.

F. Insulation
1. Minimum 6" thick, R-19 fiberglass blankets in wall cavity

2. Minimum R38 blown-in fiberglass insulation above ceiling

G. Vapor Retarder
1. 4 mil thickness polyethylene sheets.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify site conditions prior to the start of construction

3.02 ERECTION - FRAMING - GENERAL

A. Erect framing in accordance with manufacturer's established construction procedures

B. Make all components and building plumb, square, straight, and true to lines in accordance with National Frame Building Association's Accepted Practices documents and specific tolerances identified in Section 3.06

C. Provide adequate temporary bracing to assure structure remains plumb and square until permanent bracing is installed

D. Altering of structural members is not permitted

3.03 ERECTION - FRAMING

A. Pre-Cast Concrete Pier Foundation Columns
1. Auger each hole to depth with diameter as required on building plans.

2. Accurately position concrete lower column in each hole

3. Place ready-mix concrete in hole to footing size and thickness indicated on building plans.

4. Backfill with dry soil, compacted in 8” lifts

B. Wood Column
1. Set wood column to interlock with concrete column connection bracket.

2. Install manufacturer’s recommended quantity and size of mechanically driven fasteners and bolts

C. Baseboards
1. Install 2”x8” treated planks at grade using builder’s recommended fasteners and brackets to attach to concrete column

D. Wall girts (nailers)
1. Install nailers as required on building plans according to manufacturer’s established construction procedures.

E. Trusses
1. Set trusses in plane with the center member of the wood column using lifting methods as approved by the manufacturer.

2. When properly positioned, install two 1/2” diameter machine bolts and manufacturer-recommended 4” structural screws through two of the wood column laminates and the truss heel.

3. Brace trusses as recommended by the manufacturer.

F. Purlins
1. Install 2”x4” purlins by attaching them to trusses according to manufacturer’s established construction procedures.

G. Lateral Bracing
1. Install 2”x6” angled bracing at locations recommended by the manufacturer according to the manufacturer’s established construction procedures.

H. Incidental Framing
1. Install 2”x4” or 2”x6” blocking as required according to building manufacturer’s recommendations.

I. Interior Framing (Stripping)

1. Install 2”x4” baseboard at 4 inch above grade and case in metal trims

2. Install 2”x4” horizontal stripping at 36” (maximum) on-center spacing in wall areas to support ribbed steel panels

3. Install 2”x4” horizontal stripping at 16” (maximum) on-center spacing in wall areas to support gypsum board

3.04 ERECTION - INSULATION

A. Wall Insulation

1. Install fiberglass batt insulation blankets to fill wall cavity between columns.

2. Install vapor retarder between insulation blankets and interior stripping.

B. Ceiling Insulation

1. Install vapor retarder between lower truss chords and ceiling panels

2. Install blown-in fiberglass in attic space

3.05 ERECTION - PREFINISHED METALS - GENERAL

A. Roofing Panels

1. Install panels perpendicular to purlins, aligned straight with end fascia.

2. Fasten panels to purlins with screw fasteners.

B. Siding and Wainscot Panels

1. Install panels perpendicular to nailers, aligned level and plumb (see Section 3.06).

2. Fasten panels to nailers with screw fasteners.

C. Interior Panels

1. Install panels perpendicular to supports, aligned level and plumb

2. Fasten wall panels to wall stripping with 1” painted screws.

3. Fasten ceiling panels to truss lower chords with 1” painted screws.

D. Trim Items

1. Install trim items at the base, at wainscot / siding panel transition, corners, top of steel siding, fascia, gables and ridge using appropriate fasteners

E. Ridge Treatments
1. Install over ridge trim using screw fasteners

F. Soffit
1. Install soffit to interlock with trim items at top of steel siding and at fascia.

2. Use solid soffit at each end overhang per building plans

3. Use combination of solid and vented soffit to provide balanced ventilation at side overhangs per building plans.

G. Gutter and Downspouts
1. Install gutters with supporting hangers spaced 24” on-center

2. Silicone sealant and silicone rubber gaskets shall be used at laps to maintain leak prevention and to relieve stress due to thermal movements.

3. Install drop outlets and downspouts to allow drainage from gutter at locations specified on building plans.

4. Secure downspout to vertical wall panels or trims with conductor bands and screws.

H. Filler Strips
1. Provide filler strips at the top and bottom of roofing panels.

3.06 TOLERANCES

A. Framing Members
1. 1/4” from level

2. 1/8” from plumb

B. Siding and Roofing Panels
1. 1/8” from true position

END OF SECTION 13 34 18

SECTION 13 34 19
METAL BUILDING SYSTEMS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Section Includes:
   1. Structural-steel framing.
   2. Metal roof panels.
   3. Metal wall panels.
   4. Metal soffit panels.
   5. Personnel doors and frames.
   6. Accessories.

1.2 REFERENCE STANDARDS

A. American Institute of Steel Construction (AISC):
   1. AISC 360 - Specification for Structural Steel Buildings.
   2. AISC 341 – Seismic Provisions for Structural Steel Buildings (when appropriate).
   3. AISC Design Guide 3 – Serviceability for Steel Buildings

B. American Iron and Steel Institute (AISI):
   1. AISI S100 - North American Specification for the Design of Cold-Formed Steel Structural Members.

C. American Welding Society (AWS):
   1. AWS D1.1 / D1.1M – Structural Welding Code – Steel.
   2. AWS D1.3 / D1.3M – Structural Welding Code – Sheet Steel.

D. ASTM International (ASTM):
   1. ASTM A 325 – Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength.
   2. ASTM A 653 / A 653M – Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
   3. ASTM A 792 / A 792M – Standard Specification for Steel Sheet, 55 % Aluminum-Zinc Alloy-Coated by the Hot-Dip Process.
   4. ASTM B 117 – Standard Practice for Operating Salt Spray (Fog) Apparatus.

5. ASTM C 518 – Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus.
6. ASTM C 1363 – Standard Test Method for Thermal Performance of Building Materials and Envelope Assemblies by Means of a Hot Box Apparatus.
7. ASTM D 522 – Standard Test Methods for Mandrel Bend Test of Attached Organic Coatings.
8. ASTM D 523 – Standard Test Method for Specular Gloss.
9. ASTM D 968 – Standard Test Methods for Abrasion Resistance of Organic Coatings by Falling Abrasive.
10. ASTM D 1308 – Standard Test Method for Effect of Household Chemicals on Clear and Pigmented Organic Finishes.
11. ASTM D 2244 – Standard Practice for Calculation of Color Tolerances and Color Differences from Instrumentally Measured Color Coordinates.
12. ASTM D 2247 – Standard Practice for Testing Water Resistance of Coatings in 100% Relative Humidity.
13. ASTM D 2794 – Standard Test Method for Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact).
14. ASTM D 3361 – Standard Practice for Unfiltered Open-Flame Carbon-Arc Exposures of Paint and Related Coatings.
15. ASTM D 4214 – Standard Test Methods for Evaluating the Degree of Chalking of Exterior Paint Films.
16. ASTM E 84 – Standard Test Method for Surface Burning Characteristics of Building Materials.
17. ASTM E 96 / E 96M – Standard Test Methods for Water Vapor Transmission of Materials.
18. ASTM E 1592 – Standard Test Method for Structural Performance of Sheet Metal Roof and Siding Systems by Uniform Static Air Pressure Difference.
19. ASTM G 87 – Standard Practice for Conducting Moist SO2 Tests.

E. Metal Building Manufacturers Association (MBMA):
   1. MBMA Metal Building Systems Manual.
   2. Seismic Design Guide for Metal Building Systems.

F. North American Insulation Manufacturers Association (NAIMA):
   1. NAIMA 202 – Standard For Flexible Fiber Glass Insulation to be Laminated for Use in Metal Buildings.

G. The Society for Protective Coatings (SSPC):
   1. SSPC-Paint 15 - Primer for Use Over Hand Cleaned Steel performs to SSPC-Paint 15 standards.
   2. SSPC-SP2 – Hand Tool Cleaning.

H. Underwriters Laboratories (UL):
   1. UL 580 – Standard for Tests for Uplift Resistance of Roof Assemblies.
   2. UL 723 – Standard for Test for Surface Burning Characteristics of Building Materials.

I. US Army Corps of Engineers (COE):
   1. COE Unified Facilities Guide Specification Section 07 61 13.

1.3 PREINSTALLATION MEETINGS

A. Convene preinstallation meeting 2 weeks before start of installation of metal building system.

B. Require attendance of parties directly affecting work of this section, including Contractor, Architect, Engineer, installer, and metal building system manufacturer's representative.

C. Review materials, installation, protection, and coordination with other work.

1.4 SUBMITTALS

A. Product Data: Submit metal building system manufacturer's product information, specifications, and installation instructions for building components and accessories.

B. Erection Drawings: Submit metal building system manufacturer's erection drawings, including plans, elevations, sections, and details, indicating roof framing, transverse cross-sections, covering and trim details, and accessory installation details to clearly indicate proper assembly of building components.

C. Certification: Submit written "Certificate of design and manufacturing conformance" prepared and signed by a Professional Engineer, registered to practice in Connecticut verifying that the metal building system design and metal roof system design (including panels, clips, and support system components) meet indicated loading requirements and codes of authorities having jurisdiction.
   1. Certification shall reference specific dead loads, live loads, snow loads, wind loads/speeds, tributary area load reductions (if applicable), concentrated loads, collateral loads, seismic loads, end-use categories, governing code bodies, including year, and load applications.
   2. Submit certification 1 week before bid date on the metal building system manufacturer's letterhead.

D. Submit certification verifying that the metal roof system has been tested and approved by Underwriter's Laboratory as Class 90.

E. Submit certification verifying that the metal standing seam roof system has been tested in accordance with ASTM E 1592 test protocols.

F. Dealer Certification: Submit certification 1 week before bid date that the metal building system supplier or metal roof system supplier is a manufacturer's authorized and franchised dealer of the system to be furnished.
   1. Certification shall state date on which authorization was granted.

G. Installer Certification: Submit certification 1 week before bid date that the metal building system or roof system installer has been regularly engaged in the installation of building systems of the same or equal construction to the system specified.

H. Warranty Documentation: Submit manufacturer's standard warranty.

1.5 QUALITY ASSURANCE

A. Manufacturer's Qualifications:
   1. Manufacturer regularly engaged, for past 10 years, in manufacture of metal building systems of similar type to that specified.
   2. Accredited based on IAS Accreditation Criteria AC472 and requirements in International Building Code (IBC), Chapter 17.

B. Installer's Qualifications:
   1. Installer regularly engaged, for past 10 years, in installation of metal building systems of similar type to that specified.
   2. Employ persons trained for installation of metal building systems.

C. Certificate of design and manufacturing conformance:
   1. Metal building system manufacturer shall submit written certification prepared and signed by a Professional Engineer, registered to practice in Connecticut verifying that building system design and metal roof system design (including panels, clips, and support system components) meet indicated loading requirements and codes of authorities having jurisdiction.
   2. Certification shall reference specific dead loads, live loads, snow loads, wind loads/speeds, tributary area load reductions (if applicable), concentrated loads, collateral loads, seismic loads, end-use categories, governing code bodies, including year, and load applications.
   3. Certificate shall be on metal building system manufacturer's letterhead.
   4. Refer to Submittals article of this specification section.

D. Material Testing:
   1. In addition to material certifications of structural steel, metal building system manufacturer shall provide, upon request at time of order, evidence of compliance with specifications through testing.
   2. This quality assurance testing shall include testing of structural bolts, nuts, screw fasteners, mastics, and metal coatings (primers, metallic coated products, and painted coil products).

1.6 DELIVERY, STORAGE, AND HANDLING

A. Delivery and Acceptance Requirements: Deliver materials to site in manufacturer's original, unopened containers and packaging, with labels clearly identifying product name and manufacturer.

B. Storage and Handling Requirements:
   1. Store and handle materials in accordance with manufacturer's instructions.
   2. Keep materials in manufacturer's original, unopened containers and packaging until installation.
   3. Do not store materials directly on ground.
   4. Store materials on flat, level surface, raised above ground, with adequate support

to prevent sagging.

5. Protect materials and finish during storage, handling, and installation to prevent damage.

1.7 WARRANTY

A. Metal building system manufacturer shall provide a written weathertightness warranty for a maximum of 25 years against leaks in standing seam roof panels, arising out of or caused by ordinary wear and tear under normal weather and atmospheric conditions.
   1. Warranty shall be signed by both the metal roof system manufacturer and the metal roof system installer.
   2. Maximum liability of warranty shall be no less than $0.70 per square foot of roof area.

B. Metal building system manufacturer shall provide a paint film written warranty for 25 years against cracking, peeling, chalking, and fading of exterior coating on painted roof and wall panels.
   1. Warranty shall be signed by metal building system or roof system manufacturer and state that the coating contains 70 percent “Kynar 500” or “Hylar 5000” resin.
   2. Metal building system manufacturer shall warrant that the coating shall not peel, crack, or chip for 25 years.
   3. For a period of 25 years, chalking shall not exceed ASTM D 4214, #8 rating and shall not fade more than 5 color difference units in accordance with ASTM D 2244.

C. Metal Building System Manufacturer’s Certification: Metal building system manufacturer shall submit a signed written Certification stating that the metal roof system manufacturer or approved representative will provide warranties and Inspection and Report Service specified in this specification section.
   1. Warranty terms shall be submitted with bid.

PART 2 PRODUCTS

2.1 MANUFACTURER

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following or approved equal:
   a. Alliance Steel, Inc.
   b. American Buildings Company; a Nucor Company.
   c. BC Steel Buildings, Inc.
   d. Butler Manufacturing Company; a division of BlueScope Buildings North America, Inc.
   e. Ceco Building Systems; an NCI company.
   f. Metallic Building Company.
   g. Nucpr Building Systems
   h. Package Industries, Inc.

2.2 Source Limitations: Obtain metal building system components, including primary and secondary framing and metal panel assemblies, from single source from single manufacturer

A. Building Dimensions: Indicated on the Drawings.
   1. Horizontal Dimensions: Measure to inside face of wall sheets.
   2. Eave Height: Measure from top of finished floor to intersection of insides of roof and sidewall sheets.
   3. Clear Height Between Finished Floor and Bottom of Roof Beams: Indicated on the Drawings.

B. Primary Structural Members:
   1. Primary Framing System: Pre-engineered metal building framing system as specified in this specification section.
   2. Frames: Welded-up plate section columns and roof beams, complete with necessary splice plates for bolted field assembly as specified in this specification section.
   3. Bolts for Field Assembly of Primary Steel: High-strength bolts as indicated on erection drawings of metal building system manufacturer.
   4. Beam and Post Endwall Frames: Endwall corner posts, endwall roof beams, and endwall posts as required by design criteria.
   5. Exterior Columns: Welded-up "H" sections or cold-formed “C” sections.
   6. Interior Columns: “H” sections or tube columns.
   7. Connection of Primary Structural Members: ASTM A 325 bolts through factory-punched holes.
   8. Primary Structural Members: Paint with metal building system manufacturer's standard primer with surface preparation as specified in this specification section.

C. Secondary Structural Members:
   1. Secondary Framing System: Pre-engineered metal building framing system as specified in this specification section.
   2. a. C/Z Purlins and Girts: Acrylic-coated G30 galvanized finish.
      b. Truss Purlins: Acrylic-coated G30 galvanized finish.

D. Metal Roof System: as specified in this specification section.

E. Metal Wall System: as specified in this specification section.

F. Where metal panels are required to be painted, use coating system as specified in this specification section.

2.3 DESIGN REQUIREMENTS

See Section 018000 Performance Standards

2.4 DEFLECTIONS

A. Structural Members:
   1. Maximum deflection of main framing members shall not exceed L/360 of their respective spans.
   2. Maximum deflection due to snow load in roof panels and purlins shall not exceed

L/240 of their respective spans.

3. Maximum deflection due to wind load in wall panels and girts shall not exceed L/180 of their respective spans.

B. Lateral deflections, or drift, at the roof level of the structure in relation to the floor or slab on grade, caused by deflection of horizontal force resisting elements, shall not exceed H/120 OR L/240 as appropriate.

C. Calculations for deflections shall be done using only the bare frame method.
   1. Reductions based on engineering judgment using the assumed composite stiffness of the building envelope shall not be allowed.

2.5 STRUCTURAL STEEL FRAMING SYSTEM

A. General:
   1. Design of Structural System: rigid frame with tapered or straight columns and roof beams, with gable or single-slope roof.
   2. Actual Building Length:
      a. Structural line to structural line.
      b. Same as nominal; i.e., number of bays times length of bays.
      c. Structural Line: Defined as inside face of wall sheets.
   3. Actual Building Width:
      a. Structural line to structural line.
      b. Nominal building width.
   4. Minimum Roof Slope: 2 inch in 12 inches.

B. Secondary Structural Members:
   1. Purlins:
      a. Purlins:
         1) "Z"-shaped, precision-roll-formed, acrylic-coated G30 galvanized steel in different gauges to meet specified loading conditions.
         2) 8-inch deep "Z" sections.
      b. Truss Purlins:
         1) Cold-formed trusses, factory assembled.
         2) 30 inches, 34 inches or 40 inches deep.
      c. Outer Flange of Purlins: Factory-punched holes for panel connections.
      d. Attach purlins to main frames and endwalls with 1/2-inch-diameter bolts.
      e. Brace purlins at intervals indicated on erection drawings furnished by metal building system manufacturer.
      f. Concentrated Loads: Hung at purlin panel points.
   2. Eave Members:
      a. Eave Struts: Factory punched 7-inch, 8-1/2-inch, 10-inch, or 11-1/2-inch-deep "C" sections, precision-roll-formed, acrylic-coated G30 galvanized steel in different gauges to meet specified loading conditions.
   3. Girts:
      a. "Z" or “C”-shaped, precision-roll-formed, acrylic-coated G30 galvanized steel in different gauges to meet specified loading conditions.

b. 7-inch, 8-1/2-inch, 10-inch, or 11-1/2-inch-deep "Z" or “C” sections.
c. Outer Flange of Girts: Factory-punched holes for panel connections.

4. Bracing:
   a. Locate bracing as indicated on the Drawings.
   b. Diagonal Bracing:
      1) Hot-rolled rods of sizes indicated on the Drawings.
      2) Attach to columns and roof beams as indicated on the Drawings.
   c. Optional fixed-base wind posts or pinned-base portal frames may be substituted for wall rod bracing on buildings as required.
   d. Flange Braces and Purlin Braces: Cold formed and installed as indicated on the Drawings.

C. Welding:
1. Welding Procedures, Operator Qualifications, and Welding Quality Standards: AWS D1.1 - Structural Welding Code – Steel and AWS D1.3 - Structural Welding Code – Sheet Steel.
2. Welding inspection, other than visual inspection as defined by AWS D1.1, paragraph 6.9, shall be identified and negotiated before bidding.
3. Certification of Welder Qualification: Supply when requested.

D. Painting of Structural Steel Framing System:
1. General:
   a. Structural Steel: Prime paint as temporary protection against ordinary atmospheric conditions.
   b. Perform subsequent finish painting, if required, in field as specified in the painting section.
   c. Before painting, clean steel of loose rust, loose mill scale, dirt, and other foreign materials.
   d. Steel Fabricator: Not required to sand blast, flame clean, or pickle steel before painting, unless otherwise specified.
2. Primary Frames:
   a. Clean steel in accordance with SSPC-SP2.
   b. Factory cover steel with 1 coat of gray water-reducible alkyd primer paint formulated to equal or exceed performance requirements SSPC-Paint 15.
   c. Minimum Coating Thickness: 1.0 mil.
3. Secondary Structural Members – Roll-Formed:
   a. Hot-dipped zinc coating, ASTM A 653, G30; followed by 1 coat of clear acrylic finish.
   b. Acrylic-Coated G30 Galvanized Steel: Equal or exceed performance requirements of SSPC Paint-15.
4. Truss Purlins:
   a. Hot-dipped zinc coating, ASTM A 653, G30; followed by 1 coat of clear acrylic finish.
   b. Acrylic-Coated G30 Galvanized Steel: Equal or exceed performance requirements of SSPC Paint-15.

2.6 METAL ROOF SYSTEM

A. Metal Roof System: .

B. Roof System Design:
1. Design roof panels in accordance with AISI North American Specification for the Design of Cold- Formed Steel Structural Members.
2. Design roof paneling system for a minimum roof slope of 2 inch in 12 inches.
3. Design roof paneling system to support design live, snow, and wind loads.
4. Endwall Trim and Roof Transition Flashings: Allow roof panels to move relative to wall panels and/or parapets as roof expands and contracts with temperature changes.

C. Roof System Performance Testing:
1. UL Wind Uplift Classification Rating, UL 580: Class 90.
2. Structural Performance Under Uniform Static Air Pressure Difference: Test roof system in accordance with ASTM E 1592.
3. Roof system has been tested in accordance with U.S. Army Corps of Engineers Unified Facilities Guide Specification Section 07 61 13.

D. Roof Panels:
1. Factory roll-formed, 24 inches wide, with 2 major corrugations, 2 inches high (2-3/4 inches including seam), 24 inches on center.
2. Flat of the Panel: Cross flutes 6 inches on center, perpendicular to major corrugations in entire length of panel to reduce wind noise.
3. Variable Width Panels:
   a. For roof lengths not evenly divisible by the 2'-0" panel width, factory-manufactured variable- width (9-inch, 12-inch, 15-inch, 18-inch, and 21-inch-wide) panels shall be used to ensure modular, weathertight roof installation.
   b. Minimum Length: 15 feet.
   c. Supply maximum possible panel lengths.
4. Panel Material and Finish:
   a. 24-gauge steel coated both sides with layer of acrylic-coated Galvalume aluminum-zinc alloy (approximately 55 percent aluminum, 45 percent zinc) applied by continuous hot-dip method.
   b. Minimum 0.55-ounce coated weight per square foot as determined by triple-spot test, ASTM A 792.
   c. Apply clear acrylic film for additional protection.
5. Panel Material and Finish:

24-gauge galvanized steel, G90 coating, ASTM A 653, G90.

a. Paint with exterior" finish system, full-strength, 70 percent "Kynar 500" or "Hylar 5000" fluoropolymer (PVDF) coating.
b. PVDF Coating Warranty: Metal building system manufacturer shall warrant coating for 25 years for the following.
   1) Not to peel, crack, or chip.
   2) Chalking: Not to exceed ASTM D 4214, #8 rating.
   3) Fading: Not more than 5 color-difference units, ASTM D 2244.

6. Panel Material and Finish: Special materials, gauges, or colors as applicable for custom designs.
7. Use panels of maximum possible lengths to minimize end laps.
8. Extend eave panels beyond structural line of sidewalls.
9. Factory punch panels at panel end to match factory-punched holes in eave structural member.
10. Panel End Splices: Factory punched and factory notched.
11. Panel End Laps: Locate directly over, but not fastened to, a supporting secondary roof structural member and be staggered, to avoid 4-panel lap-splice condition.
12. End Laps: Floating. Allows roof panels to expand and contract with roof panel temperature changes.
13. Self-Drilling Fasteners: Not permitted.
14. Ridge Assembly:
    a. Design ridge assembly to allow roof panels to move lengthwise with expansion and contraction as roof panel temperature changes.
    b. Factory punch parts for correct field assembly.
    c. Install panel closures and interior reinforcing straps to seal panel ends at ridge.
    d. Do not expose attachment fasteners on weather side.
    e. Use lock seam plug to seal lock seam portion of panel.
    f. High-Tensile Steel Ridge Cover: Span from panel closure to panel closure and flex as roof system expands and contracts.

E. Provision for Expansion and Contraction:
1. Provision for Thermal Expansion Movement of Roof Panels: Clips with movable tab.
   a. Stainless Steel Tabs: Factory centered on roof clip when installed to ensure full movement in either direction.
   b. Maximum Force of 8 Pounds: Required to initiate tab movement.
   c. Each Clip: Accommodates a minimum of 1.25-inch movement in either direction.
2. Roof: Provide for thermal expansion and contraction without detrimental effects on roof panels, with plus or minus 100-degree F temperature difference between interior structural framework of building and of roof panels.

F. Fasteners:
1. Make connections of roof panels to structural members, except at eaves, with clips with movable stainless steel tabs, seamed into standing seam side lap.
2. Fasten panel clips to structural members with fasteners in accordance with erection drawings furnished by metal building system manufacturer, using factory-punched holes in structural members.
   a. Fasteners: Metal-backed rubber washer to serve as torque indicator.

3. Exposed fasteners penetrating metal roof membrane at the following locations do not exceed the frequency listed:
   a. Basic Panel System: 0 per square foot.
   b. High Eave Trim, No Parapet: 2 per linear foot.
   c. Exterior Eave Gutter: 2 per linear foot.
   d. Panel Splices: 2 per linear foot.
   e. Gable Trim: 0 per linear foot.
   f. High Eave with Parapet: 0 per linear foot.
   g. Ridge: 0 per linear foot.
   h. Low Eave Structural: 1.5 per linear foot.

G. Accessories:
1. Accessories (i.e., ventilators, skylights, gutters, fascia): Standard with metal building system manufacturer, unless otherwise noted and furnished as specified.
2. Exterior Metal Coating on Gutters, Downspouts, Gable Trim, and Eave Trim finish system, full- strength, 70 percent "Kynar 500" or "Hylar 5000" fluoropolymer (PVDF) coating.
3. Location of Standard Accessories: Indicated on erection drawings furnished by metal building system manufacturer.
4. Material used in flashing and transition parts and furnished as standard by metal building system manufacturer may or may not match roof panel material.
   a. Parts: Compatible and not cause corrosive condition.

2.7 METAL ROOF SYSTEM

A. Metal Roof System: Standing Seam Metal roof system.

B. Roof System Design:
1. Design roof panels and liner panels in accordance with AISI North American Specification for the Design of Cold-Formed Steel Structural Members.
2. Design roof paneling system to support design live, snow, and wind loads.
3. Endwall Trim and Roof Transition Flashings: Allow roof panels to move relative to wall panels and/or parapets as roof expands and contracts with temperature changes.

C. Roof System Performance Testing:
1. UL Wind Uplift Classification Rating, UL 580: Class 90.
2. Structural Performance Under Uniform Static Air Pressure Difference: Test roof system in accordance with ASTM E 1592.
3. Roof system has been tested in accordance with U.S. Army Corps of Engineers Unified Facilities Guide Specification Section 07 61 13.

D. Roof Panels:
1. Factory roll-formed, 24 inches wide, with 2 major corrugations, 2 inches high (2-3/4 inches including seam), 24 inches on center.
2. Flat of the Panel: Cross flutes 6 inches on center, perpendicular to major corrugations in entire length of panel to reduce wind noise.
3. Variable Width Panels:

a. For roof lengths not evenly divisible by the 2'-0" panel width, factory-manufactured variable- width (9-inch, 12-inch, 15-inch, 18-inch, and 21-inch-wide) panels shall be used to ensure modular, weathertight roof installation.
b. Minimum Length: 15 feet.
c. Supply maximum possible panel lengths.

4. Panel Material and Finish:
   a. 24-gauge galvanized steel, G90 coating; ASTM A 653, G90.
   b. Paint with exterior colors finish system, full-strength, 70 percent "Kynar 500" or "Hylar 5000" fluoropolymer (PVDF) coating.
   c. PVDF Coating Warranty: Metal building system manufacturer shall warrant coating for 25 years for the following.
      1) Not to peel, crack, or chip.
      2) Chalking: Not to exceed ASTM D 4214, #8 rating.
      3) Fading: Not more than 5 color-difference units, ASTM D 2244.
5. Panel Material and Finish: Special materials, gauges, or colors as applicable for custom designs.
6. Use panels of maximum possible lengths to minimize end laps.
7. Extend eave panels beyond structural line of sidewalls.
8. Factory punch panels at panel end to match factory-punched holes in eave structural member.
9. Panel End Splices: Factory punched and factory notched.
10. Panel End Laps: Locate directly over, but not fastened to, a supporting secondary roof structural member and be staggered, to avoid 4-panel lap-splice condition.
11. End Laps: Floating. Allows roof panels to expand and contract with roof panel temperature changes.
12. Self-Drilling Fasteners: Not permitted in weathering membrane of roof system.
13. Ridge Assembly:
    a. Design ridge assembly to allow roof panels to move lengthwise with expansion and contraction as roof panel temperature changes.
    b. Factory punch parts for correct field assembly.
    c. Install panel closures and interior reinforcing straps to seal panel ends at ridge.
    d. Do not expose attachment fasteners on weather side.
    e. Use lock seam plug to seal lock seam portion of panel.
    f. High-Tensile Steel Ridge Cover: Span from panel closure to panel closure and flex as roof system expands and contracts.

E. Provision for Expansion and Contraction:
   1. Provision for Thermal Expansion Movement of Roof Panels: Clips with movable tab.
      a. Stainless Steel Tabs: Factory centered on roof clip to ensure full movement in either direction.
      b. Maximum Force of 8 Pounds: Required to initiate tab movement.
      c. Each Clip: Accommodates a minimum of 1.25-inch movement in either direction.
   2. Roof: Provide for thermal expansion and contraction without detrimental effects on roof panels, with plus or minus 100-degree F temperature difference between interior structural framework of building and of roof panels.

F. Fasteners:
1. Make connections of roof panels to structural members, except at eaves, with clips with movable stainless steel tabs, seamed into standing seam side lap.
2. Fasten insulation board, bearing plates, and panel clips to structural members with "Scrubolt™" fasteners in accordance with erection drawings furnished by metal building system manufacturer,
using factory-punched or field-drilled holes in structural members.
   a. Fasteners: Metal-backed rubber washer to serve as torque indicator.
3. Fasteners penetrating metal membrane at the following locations do not exceed the frequency listed:
   a. Basic Panel System: 0 per square foot.
   b. High Eave Trim, No Parapet: 2 per linear foot.
   c. Exterior Eave Gutter: 2 per linear foot.
   d. Panel Splices: 2 per linear foot.
   e. Gable Trim: 0 per linear foot.
   f. High Eave with Parapet: 0 per linear foot.
   g. Ridge: 0 per linear foot.
   h. Low Eave Structural: 1.5 per linear foot.

G. Accessories:
1. Accessories (i.e., ventilators, skylights, gutters, fascia): Standard with metal building system manufacturer, unless otherwise noted and furnished as specified.
2. Metal Coating on Gutters, Downspouts, Gable Trim, and Eave Trim finish system, full-strength, 70 percent "Kynar 500" or "Hylar 5000" fluoropolymer (PVDF) coating.
3. Location of Standard Accessories: Indicated on erection drawings furnished by metal building system manufacturer.
4. Material used in flashing and transition parts and furnished as standard by metal building system manufacturer may or may not match roof panel material.
   a. Parts: Compatible and not cause corrosive condition.
   b. Copper and Lead Materials: Do not use with Galvalume or optional aluminum-coated panels.

2.8 METAL WALL SYSTEM

A. Exterior Metal Wall System: Reverse-Rib, Metal Wall Panels" wall system.

B. Wall System Design: Design wall panels in accordance with AISI North American Specification for the Design of Cold-Formed Steel Structural Members.

C. Wall Panels:
1. Roll-formed panels, 3 feet wide with 4 major corrugations, 1-1/2 inches high, 12 inches on center, with 2 minor corrugations between each of the major corrugations entire length of panel.
2. One piece from base to building eave.
3. Upper End of Panels: Fabricate with mitered cut to match corrugations of "" roof panels of 1/2 inch to 12 inches and square cut for all other roof panels and slopes.
4. Factory punch or field drill wall panels at panel ends and match factory-punched or

field-drilled holes in structural members for proper alignment.

5. Panel Material and Finish:
   a. 26-gauge painted Galvalume aluminum-zinc alloy (approximately 55 percent aluminum, 45 percent zinc), ASTM A 792.
   b. Paint with exterior colors finish system, full-strength, 70 percent "Kynar 500" or "Hylar 5000" fluoropolymer (PVDF) coating.
   c. PVDF Coating Warranty: Metal building system manufacturer shall warrant coating for 25 years for the following.
      1) Not to peel, crack, or chip.
      2) Chalking: Not to exceed ASTM D 4214, #8 rating.
      3) Fading: Not more than 5 color-difference units, ASTM D 2244.
6. Panel Material and Finish: Special materials, gauges, or colors as applicable for custom designs.

D. Fasteners:
1. Wall Panel-to-Structural Connections: Torx-head fasteners.
2. Wall Panel-to-Panel Connections: Torx-head self-drilling screws.
3. Fastener Locations: Indicated on erection drawings furnished by metal building system manufacturer.
4. Exposed Fasteners: Factory painted to match wall color.

E. Accessories:
1. Accessories (i.e., doors, windows, louvers): Standard with metal building system manufacturer, unless otherwise noted and furnished as specified.
2. Location of Standard Accessories: Indicated on erection drawings furnished by metal building system manufacturer.

F. Accessories:
1. Accessories (i.e., doors, windows): Design to fit wall panel system or framed openings and furnish as standard by metal building system manufacturer, unless otherwise noted.
2. Location of Standard Accessories: Indicated on erection drawings furnished by metal building system manufacturer.

G. Fasteners:
1. Sub-structurals and Liner Panels: Install with self-drilling screws for attachment
2. Roof Attachment Fasteners: As specified under Roof System in this specification section.

H. Provision for Expansion and Contraction:
1. Provision for Thermal Expansion and Contraction Movement: Accomplish in roof system.
2. As specified under Roof System in this specification section.

I. Performance Testing: As specified under Roof System in this specification section.

2.9 METAL COATING SYSTEM

A. Substrate Preparation:
1. G90 Hot-Dipped Galvanized Steel or AZ50 Galvalume: Factory-controlled chemical-

conversion treatment.

B. Coating:
1. Material: Full-strength, 70 percent, “Kynar 500” or “Hylar 5000” fluoropolymer (PVDF) color coating.
2. After steel preparation, coat exterior exposed surface with primer and PVDF
   a. Nominal Total Dry Film Thickness: 1.0 mil.
3. Interior Exposed Surfaces: Coat with polyester color coat.
4. Apply coatings to entire material dimensions of steel sheets before forming of panels.

C. Physical Characteristics of Exterior Coating:
1. Resistance to failure through cracking, checking, peeling, and loss of adhesion.
2. Measure by the following laboratory weather-simulating tests to obtain test results justifying metal building system manufacturer's 25-year warranty:
   a. Humidity resistance at 100 degrees F and 100 percent relative humidity, ASTM D 2247.
   b. Salt-spray resistance at 5 percent salt fog, ASTM B 117.
   c. Reverse impact resistance, ASTM D 2794.
   d. Resistance to accelerated weathering, Atlas Model XW-R Dew Cycle Weather-O-Meter, ASTM D 3361.
   e. Resistance to dry heat.
   f. Abrasion resistance, ASTM D 968.
   g. Chemical/acid/pollution resistance, ASTM D 1308 and G 87.
   h. Maintain gloss of finish evenly over entire surface, ASTM D 523

PART 3 EXECUTION

3.1 EXAMINATION

A. Examine area to receive metal building system.

B. Notify Architect of conditions that would adversely affect installation or subsequent use.

C. Do not begin installation until unacceptable conditions are corrected.

3.2 ERECTION – STRUCTURAL STEEL FRAMING SYSTEM

A. Erect structural steel framing system in accordance with the Drawings and metal building system manufacturer’s erection drawings.

B. Field Modifications:
1. Require approval of metal building system manufacturer.
2. Responsibility of building erector.
3. Field Modifications to Truss Purlins: Not allowed, unless indicated on erection drawings furnished by metal building system manufacturer.

C. Fixed Column Bases: Grout flush with floor line after structural steel erection is complete.

3.3 INSTALLATION – METAL ROOF SYSTEM

A. Metal Roof System Installation: Standing Seam Metal roof system.
   1. Install roof system in accordance with metal building system manufacturer's instructions at locations indicated on the Drawings.
   2. Install roof system weathertight.
   3. Position panel clips by matching hole in clip with factory-punched holes in secondary structural members.
   4. Position and properly align panels by matching factory-punched holes in panel end with factory- punched holes in eave structural member and by aligning panel with panel clip.
   5. Field seam panel side laps by self-propelled and portable electrical lock-seaming machine.
      a. Machine field forms the final 180 degrees of a 360-degree Pittsburgh double-lock standing seam.
      b. Factory apply side lap sealant.
   6. Panel End Laps: Minimum of 6 inches, sealed with sealant (weather sealing compound), and fastened together by clamping plates.
      a. Sealants: Contain hard nylon beads, which prevent mastic from flowing out due to clamping actions.
      b. Join panel laps by 2-piece clamped connection consisting of a bottom reinforcing plate and a top panel strap.
      c. Locate panel end laps directly over, but not fastened to, supporting secondary roof structural member and stagger, to avoid 4-panel lap-splice condition.
   7. Minimum Blanket Insulation Thickness: 2 inches.

3.4 INSTALLATION – METAL WALL SYSTEM

A. Metal Wall System Installation: Reverse Rol" wall system.
   1. Install wall system in accordance with metal building system manufacturer's instructions at locations indicated on the Drawings.
   2. Install wall system weathertight.
   3. Verify structural system is plumb before wall panels are attached.
   4. Align and attach wall panels in accordance with erection drawings furnished by metal building system manufacturer.
   5. Install side laps with minimum of 1 full corrugation.
   6. Seal wall panels at base with metal trim and foam or rubber closures.
   7. Exterior Trim: Apply same finish as exterior color of wall panels, except the following:
      a. Gutters, Downspouts, Eave Trim, Gable Trim, Door-Side Flashings, and Header Flashings: Paint with exterior finish system, full-strength, 70 percent "Kynar 500" or "Hylar 5000" fluoropolymer (PVDF) coating in standard color of metal building system manufacturer.
      b. Windows: Factory paint aluminum extrusions (thermally broken).
   8. Flashings, Trim, Closures, and Similar Items: Install as indicated on erection drawings furnished by metal building system manufacturer.

3.5 PROTECTION

A. Protect installed metal building system to ensure that, except for normal weathering, metal building system will be without damage or deterioration at time of Substantial Completion.

END OF SECTION 13 34 19

SECTION 31 01 00
MAINTENANCE OF EARTHWORK

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

Standard Specification - The Standard Specifications for Roads, Bridges, and Incidental Construction, Supplement Form 818, dated January 2023 of the State of Connecticut, as specifically referenced to in the Technical Specifications, shall apply and be considered a part of this specification as though it were bound herein. The Standard Specification is available from: https://portal.ct.gov/DOT/IT/ConnDOT-Publications-Manuals

Connecticut Guidelines for Soil Erosion and Sediment Control 2024

1.2 SUMMARY

A. Work Included: Providing all site preparation as shown on the Contract Drawings, and as specified, including , but not limited to the following:

1. Site preparation
2. Furnish and install temporary and permanent erosion and sedimentation control measures and anti-tracking pad/construction entrance.
3. General site excavation and earthwork not covered in other Sections.
4. Installation and maintenance of tree protection fence and removal when no longer required
5. Dust control
6. Protection of existing trees designated to remain
7. Furnish and Install temporary construction fence
8. Clearing and grubbing turf, trees and shrubs designated to be removed
9. Selective clearing and thinning
10. Stripping and stockpiling existing topsoil
11. Debris removal

B. Work Excluded: The excavation, handling, storage, stockpiling, removal, and disposal of hazardous materials if encountered.

1.3 PROJECT CONDITIONS

A. Peripheral: areas outside of the work area shall not be disturbed or used for storing materials.

B. Contractor shall protect all existing utilities, site improvements, pavements, plant material or other improvements to remain or that are outside of the work area from damage. It shall be the Contractors responsibility to repair or replace any damage to these items immediately at no additional expense to the Owner.

C. Topsoil Stockpile Area: Shall generally be as depicted on the Contract Drawings and must be approved by the Owner prior to placement of topsoil stockpiles.

D. Dust Control: Use all means necessary to control dust on and near the construction areas caused by the Contractor's performance of work. Calcium Chloride may be used.

E. Call Before You Dig: Contractor shall contact Call Before You Dig at 811 prior to commencing any earthwork operations.

PART 2 - PRODUCTS

2.1 FILTER BARRIERS

A. Filter fabric fence shall conform to the requirements of the Standard Specification, Section 7.55.02. Fabric sedimentation barrier of "Silt Fence with Belt" manufactured by Mirafi, Inc., P.O. Box 240967, Charlotte, North Carolina or equal approved by the Engineer.

B. Hay bales shall conform to the requirements of the Standard Specification, Article 2.19.02. Stakes shall be 2 inches x 3 feet-0 inches long, pointed on one end.

2.2 FILTER FABRIC

A. Filter fabric shall conform to section M.08.01-19 of Form 818.

2.3 INLET SEDIMENTATION CONTROL DEVICES

A. Inlet sedimentation control devices for catch basins shall be as shown on the Contract Drawings. The devices shall be "Siltsack" catch basin filters manufactured by ACF Environmental or approved equal.

2.4 DEWATERING FILTER BAGS

A. Geotextile silt bags for pump discharges shall be ACF Heavy Duty Dirtbag® 55 or approved equal.

2.5 CRUSHED STONE

A. Crushed stone for anti-tracking pads, berms, check dams, hay bale de-watering areas and other erosion and sedimentation control measures shall conform to section M.01.02 of Form 818 for the size specified on the Contract Drawings.

2.6 SLOPE STABILIZATION

A. Materials for this work shall be included on the State of Connecticut DOT Qualified Product List and conform to the following requirements of Section 9.50.02 of the Standard Specification.

B. Erosion control matting shall be Class 1: Slope Protection, Type D (Slopes steeper than 3:1 – sandy soil), as outlined on the State of Connecticut DOT Qualified Product List.

C. Erosion control matting shall be coconut fiber, straw fiber, or a blend of the two. Matting must be 100% biodegradable, with a degradable life of 12 to 18-months.

2.7 TREE PROTECTION FENCE

A. Shall be: 4’-0” high ‘Safety Barricade’ fencing, model UX4050 as manufactured by Tensar Corporation, Morrow, GA, and distributed by Contech Construction Products, Cheshire, CT or approved equal.
   1. Color: Orange, height 4’-0”
   2. Top tension rope: 3/8” braided nylon/polypropylene rope.

B. Posts: Heavy gauge steel posts 6’0” long, suitable for driving.

2.8 TEMPORARY CONSTRUCTION FENCE

A. Temporary construction fence shall be constructed of minimum 6’ high portable chain link panels. Panels shall have stands or “feet” supporting each panel or posts may be driven into the ground surface. Panels shall be secured to each other. Panels shall be secured to the ground or shall be weighted down.

PART 3 - EXECUTION

3.1 EROSION AND SEDIMENTATION CONTROL

A. Before construction begins, install silt fence sedimentation barrier, hay bales, stone berms and check dams and wood chip berms where shown on the drawings, around drainage structures, and as required by field conditions, or Local Authorities.

B. Conform to details on the drawings for silt fence sedimentation barrier: use stakes supplied by the fence manufacturer; follow installation instructions. Hay bales shall be held in place by minimum 2 stakes driven through each bale.

C. Maintain by re-staking, adjustment or replacement, as required. Remove excessive buildup of silt.

D. Before construction begins, provide anti-tracking pad/construction entrance where shown on the drawings.

E. Remove and replace anti-tracking pad if contaminated.

F. Provide water bars on excavated travel ways as shown on the plans.

G. Provide stone check dams and inlet sedimentation control devices at all catch basin inlets.

H. Provide hay bale check dams at culvert outlets and within grass swales as shown on the plans.

I. Provide slope stabilization matting where shown or specified on the plans.

J. Conform to "Connecticut Guidelines for Soil Erosion and Sediment Control," by the Connecticut Council on Soil and Water Conservation, 2002.

K. Erosion and sedimentation control measures to be maintained until final landscaping has been established and the site is stabilized.

L. Remove and dispose of siltation control materials legally, off-site after site stabilization and no further chance for any erosion.

3.2 TREE PROTECTION FENCE

A. Review all limits of fencing, sedimentation control and other construction barriers with the Owner’s Representative prior to installation.

B. Install tree protection fencing around all trees to remain and as indicated on the drawings.
   1. Post Burial Depth: 2’0” so that the top of fence is flush with post. Space posts 6’0” on center.
   2. Fencing fabric: shall be attached to posts as per the manufacturer’s recommendations. Provide top tension line and weave through the top edge of fence fabric. Secure to terminal posts. Maintain until completion of work.

C. Maintain, restore and repair all fencing until removal.

D. Do not remove any fencing until the completion of the Contract or as approved.

3.3 PROTECTION OF THE EXISTING SHRUBS/TREES

A. General: Protect all existing trees and shrubs designated to remain unless the Owner's representative evaluates in the field for tree to be removed.

B. Repair immediately any damage done to tree crowns or root systems.
   1. Cutting shall be performed by a licensed arborist approved by the Owner's representative.

3.4 CLEARING AND GRUBBING

A. General: Remove all trees and shrubs in areas of construction as designated on the drawings including cutting, grubbing, removing and disposing of trees, brush, stumps, roots and rubbish. Drawings indicate trees to be removed and approximate limits of existing vegetation to remain.

B. Conform with Article 2.01.03 of CTDOT form 818.

C. No burying of materials on-site is permitted. Remove and legally dispose of all cleared and chipped materials off-site. Remove stumps to a depth of 24" below graded surface only where grubbing operations are permitted. Typical limit of clearing is the limit of grading/edge of sedimentation system, Do not conduct and activities/disturbance outside of the designated construction area without specific approval of the Owner's representative. Remove designated miscellaneous improvements/items as noted. Treat all flush cut stumps with stump treatment in accordance with the manufacturer's recommendations immediately after cutting with suitable spray equipment. Avoid overspray onto adjacent surfaces or remaining vegetation.

3.5 SELECTIVE CLEARING AND THINNING

A. Comply with Article 9.52.03 of CTDOT Form 818.

B. Selectively prune designated branches and limbs on all remaining vegetation. Remove poorly formed, diseased, crossing and overlapping branches as designated. All selective clearing work to be performed by a certified Arborist licensed in the State of Connecticut. Remove and dispose of all material off-site in a satisfactory manner. All work shall conform to National Arborist Association Class II Standards.

C. Eradicate all poison ivy within the limits of work.

D. Remove existing pavements, walls, curbing, and foundations, as shown on the drawings. Protect stone walls, foundations, ruins, and other existing improvements that are scheduled to remain or are outside of outside of the work area.

E. All trees scheduled to be removed shall be visibly flagged by the Contractor at least five days prior to the cutting of such trees.

F. The Owner's representative will inspect the identified trees and verify the limits of clearing and thinning prior to the Contractor proceeding with his cutting operation.

G. Selectively clear and prune branches as required to install improvements adjacent to existing vegetation.

3.6 STRIPPING AND STOCKPILING TOPSOIL

A. General: Topsoil is defined as friable loam surface soil. Satisfactory topsoil is reasonably free of subsoil, clay lumps, stones, and other objects over 2" in diameter, and without weed, roots and other objectionable material.

B. Strip topsoil in a manner to prevent intermingling with the underlying subsoil, demolition debris, or other objectionable material.
   1. Prepare the areas of existing loam so as to provide clump free topsoil. Use a sod cutting rototiller, screen the topsoil, or use another method approved.
   2. Where trees are indicated to be left standing, hold topsoil stripping a sufficient distance away to prevent damage to the root system.

C. Stockpile topsoil in storage piles constructed to freely drain surface water, as approved by the Owner's representative.

D. Topsoil stockpiles shall be immediately seeded as outlined on the plans to prevent erosion.

E. Upon completion of the project: any excess topsoil, if present, shall remain the property of the Owner. The Contractor shall haul all excess topsoil to a location designated by the Owner.

3.7 DEBRIS REMOVAL

A. Remove all downed trees, tree branches, litter, river flotsam, and all other miscellaneous debris from the ground surface and below any topsoil layer within the work area.

3.8 DISPOSAL

A. All cleared and grubbed material, existing improvements designated for removal and disposal, debris removed, remain the property of the Contractor and shall be disposed of legally off-site by the Contractor.

B. No burning or burying on-site will be allowed.

3.9 DUST CONTROL

A. The Contractor shall exercise every precaution and means to prevent and control dust arising out of all construction operations from becoming a nuisance to abutting property owners or surrounding neighborhoods. Pavements adjoining the site shall be kept' broomed off and washed clean of excess materials wherever and whenever directed. Repeated daily dust control treatment shall be provided to satisfactorily prevent the spread of dust until permanent pavement repairs are made and until earth stockpiles have been removed, and all construction operations that might cause dust have been completed. No extra payment will be made for dust control measures.

B. Only water or an approved equal may used for site dust control. The use of calcium chloride is allowed.

3.10 GENERAL EXCAVATION

A. The work covered under this Section shall consist of the removal of all materials, not included in other Sections, required to accomplish the work indicated within the work limits on the Contract Drawings. The Contractor shall remove all existing pavements, sidewalks, curbs, bases, subbase, earth, rock, etc., and all other material necessary for the site improvements shown on the Contract Drawings or as directed by the Owner. Also included is the disposal of surplus material or unsuitable material, removal of old foundations, concrete or masonry walls, slabs and other structures. When unsuitable material has to be excavated below the subgrade, the excavation shall be backfilled and compacted up to the subgrade with material as ordered by the Owner.

B. Construction methods shall conform to the applicable provision of Article 2.02.03 for reconstruction of paved areas. The word “general” shall be substituted for the word “roadway”. At all limits of construction, the existing pavement shall be saw cut.

END OF SECTION 31 01 00

SECTION 31 20 00
EARTH MOVING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.
Standard Specification - The Standard Specifications for Roads, Bridges, and Incidental Construction, Supplement Form 818, dated January 2023 of the State of Connecticut, as specifically referenced to in the Technical Specifications, shall apply and be considered a part of this specification as though it were bound herein. The Standard Specification is available from: https://portal.ct.gov/DOT/IT/ConnDOT-Publications-Manuals

1.2 SUMMARY

A. Work Included: Providing all grading, cutting, filling and earth moving as shown on the Contract Drawings, and as specified, including , but not limited to the following:

1. Site grading, filling and compacting to the indicated elevations and contours, including general excavations and backfilling site improvements.
2. Provide satisfactory fill materials as required to achieve indicated finished grade.
3. Remove all soils including but not limited to excess and/or unsuitable soil.
4. Subgrade preparation and compaction.
5. Provide controlled fill under pavements, structures, and other improvements as detailed.

B. Work Excluded: The excavation, handling, storage, stockpiling, removal, and disposal of hazardous materials if encountered.

1.3 SUBMITTALS

A. Certified sieve/mechanical analysis are required to be provided by the Contractor of all off-site borrow materials and of any on-site materials proposed for use as controlled fill. Analysis shall include 200 sieve hydrometer wash as per ASTM D422 to isolate specific percentages of any silt and clay.

B. Compaction test results.

1.4 QUALITY ASSURANCE

A. Standards: as defined in State of Connecticut, Department of Transportation Standard Specifications Form 818.

B. Any materials which do not meet the description for Fill Materials shall not be used as fill, and shall be disposed of legally off-site, or as directed by the Owner's Representative. Unsuitable uncontaminated materials shall be stored separately from other materials and shall be removed and disposed of offsite.

1.5 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Keep different types of fill and excavation materials well separated to insure proper positioning of various materials and no cross contamination.

1.6 PROJECT CONDITIONS

A. Dust Control: Use all means necessary to control dust on and near the construction areas caused by the Contractor's performance of work. Calcium Chloride may be used.

B. Protect all existing improvements, utilities and pavements designated to remain.

C. Call Before You Dig: Contractor shall contact Call Before You Dig at 811 prior to commencing any earthwork operations.

D. Protect excavations by shoring, sheeting, bracing, underpinning, pumping or other methods as required to prevent cave-ins or loose dirt from entering excavations. Barricade excavation. Post warning lights at work adjacent to public streets and walks. Adhere to all applicable laws and regulations.

E. The Contractor shall acquaint himself with the located utilities. Protect all utilities designated to remain within the area of work. Any damage to existing facilities by reason of his performance of the work under this contract will be his responsibility and repaired at his expense in conformance with the applicable utility company, municipal and state requirements. Maintain existing systems in operation as required during installation of new work.

F. Protect All Benchmarks, monuments, and property boundary markers. Replace if destroyed by the Contractor's operations.

G. Do not proceed with any rock excavation until authorized by the Owner. Rock is defined herein as boulders measuring 2.0 cubic yards or more in volume; solid rock, ledge rock or rock hard cementitious deposits that require blasting or rippers to break up, prior to its removal when encountered within the limits of excavation. Any parts of stone, brick or concrete pavements and parts of cemented or masonry structures measuring 2.0 cubic yards or more that require blasting for removal will be included as rock when encountered within the limits of excavation.

H. The Contractor shall establish separate stockpile areas for excavated unsuitable uncontaminated materials for their removal and disposal from the site

PART 2 - PRODUCTS

2.1 CONTROLLED FILL: 3/8-inch crushed stone or granular material conforming to CTDOT Form 818, Section M.02 and the following gradation:

Square Mesh Sieve	% Passing (by Weight)
3½ - inch	100
¾ - inch	50-100
No. 4	25-75
The fraction passing the No. 4 sieve shall have less than 15% passing the No. 200 sieve	

2.2 GENERAL FILL: Material used for general filling outside of limits of pavement, structures, and other improvements shall be approved material, obtained from off-site sources or from on-site excavation. General fill material shall be clean, free of boulders, clay and organic material and capable of achieving the specified compaction.

2.3 TRENCH BEDDING AND BACKFILL MATERIALS: Conform to the requirements of the individual utility specification.

2.4 GRAVEL SUBBASE: All materials for this work shall conform to the requirements of Articles M.02.02 and M.02.06. of Form 818

2.5 PROCESSED GRAVEL: All materials for this work shall conform to the requirements of Article M.05.01 of Form 818.

2.6 CRUSHED STONE: 3/8” crushed stone, conforming to CTDOT Form 818, M.01.02, gradation No. 8. 3/4” crushed stone, conforming to CTDOT Form 818, M.01.02, gradation No. 6. 1½” crushed stone, conforming to CTDOT Form 818, M.01.02, gradation No. 4.

2.7 BORROW/EXISTING GRAVEL MATERIALS: Borrow or existing gravel materials used for the formation of embankments shall conform to Article 2.02.03 of DOT Form 818 for performance when incorporated into embankments.

PART 3 - EXECUTION

3.1 GENERAL

A. Make site excavation and fill operations to the lines and grades indicated on the plans and conduct the work so as to cause a minimum disturbance to adjacent areas.

B. Do not fill when earth is frozen or in wet condition. Do not excavate to full depth in freezing temperature unless structures or footings are immediately installed.

C. Areas to be filled shall be free of water, debris, refuse and compressible or decayable materials. Before placing any fill remove all topsoil, loose silty soils, existing fills, structures and all organic, excessively wet and other unsuitable materials.

D. Provide a minimum 6-inch layer of 3/8" crushed stone capillary barrier as an initial layer over wet subgrades. The stone shall be compacted by 5 passes of a vibratory compactor with a static weight of at least 2 tons and a minimum dynamic force of 4 tons.

3.2 DEWATERING

A. Provide all required channeling, piping and pumping necessary to keep excavated areas clear of standing water. Maintain site drainage at all times.

B. Groundwater shall be managed by pumping as needed to a clear water discharge

C. At the completion of dewatering activities, remove temporary facilities and restore any damaged areas.

3.3 COMPACTION REQUIREMENTS

A. In fill areas, compact subsoil to at least 93% of modified optimum density.

B. Compact all backfill and controlled fill beneath structures and under pavements to at least 95% modified optimum density in accordance with ASTM D-1557.

C. Compact fill 2.5-feet or more below finished landscape area grades to at least 90% modified optimum density.

D. Compact processed stone bases to at least 97% of the modified optimum density.

E. Compact bituminous concrete to at least 94% of the Marshall Value.

3.4 PREPARATION FOR PAVEMENTS AND STRUCTURES IN EARTH CUTS OR FILLS

A. Clear and grub in undisturbed areas.

B. Remove topsoil, organic deposits and existing fills from beneath fill areas.

C. Compact natural subgrade surface to at least 93% of modified optimum density. Remove subsoil which cannot be compacted to achieve this density.

D. Remove wet subsoils to permit acceptable compaction of fills. Provide capillary water barrier.

E. Provide 12-inch minimum subbase consisting of controlled fill, gravel subbase, or processed gravel material or as outlined on the Contract Drawings.

3.5 PREPARATION FOR PAVEMENTS IN ROCK CUTS

A. Remove rock or over blast to at least 2.5-feet below proposed finished grade.

B. Excavate to at least 20” below finished pavement grades. Remove large rock that protrudes into the subgrades and any large loose rock pieces.

C. Place a minimum 4” layer of 3/8” crushed stone.

D. The material above the crushed stone shall be controlled fill or class A material or conform to the pavement section shown on the Contract Drawings.

3.6 SUBGRADE PREPARATION

A. Prepare the subgrade by removing all unsuitable material and backfilling with controlled fill.

B. After compacting, the subgrade shall be true to the required line and grade. Maintain the subgrade surface to permit proper drainage. Protect the completed subgrade from damage.

C. Subgrade must be approved by the Owner’s Representative prior to the application of any pavement base materials.

3.7 EMBANKMENT FORMATION

A. The formation of embankments shall conform to the requirements of Article 2.02.03 of DOT From 818.

B. The prepared foundation for embankments shall be carefully shaped to the required cross-section and compacted as specified.

C. Embankments shall be formed using controlled fill, processed blasted rock borrow or existing gravel materials.

D. The embankment materials shall be spread uniformly upon the required grade, in courses not to exceed the specified thickness after compaction. Embankment formation shall extend horizontally outside pavements and structures for a distance equal to at least the depth of the fill.

E. After each course has been placed, its entire area shall be compacted with equipment specifically manufactured for that purpose. Compaction shall be continued until the entire course is uniformly compacted to not less than 95% of the dry density for that material when tested in accordance with ASTM D-1557.

F. Each layer shall be compacted at optimum moisture content. No subsequent layer shall be placed until the specified compaction is obtained for the previous layer.

G. Embankment formation to at least 3-feet below proposed finished pavement grades shall be controlled fill or processed rock material; compacted layers not exceeding 10-inches and compacted to at least 95% of the modified optimum density.

H. The material 3-feet or more below the finished pavement grade may be controlled fill, processed rock material, or borrow.

I. During wet periods, provide an initial 4-inch deep layer of 3/8-inch crushed stone on the natural subgrade beneath subgrade

3.8 TRENCH EXCAVATION AND BACKFILLING

A. Unless otherwise specified, conform to CTDOT Form 818, Article 2.86.03 and Article 10.01.03, as applicable.

B. Trench to the minimum width necessary for proper installation of the utility, with sides as nearly vertical as possible. Accurately grade the bottom to provide uniform bearing for the utility.

C. Provide bedding as required.

3.9 ROCK EXCAVATION

A. Remove and legally dispose of, off site, rock if encountered, as defined below when encountered.
   1. All solid rock, pavements, or structures that require breaking by hand power tools (jackhammers, etc.) prior to removal.
   2. Boulders, pavements, or structures measuring 2 cubic yard or more that require breaking for removal.

B. Blasting if required shall conform to Article 1.20-1.07.08 of Form 818 and all Federal, State, and Local regulations.

C. Excavate rock within the following limits. No payment will be made for rock removal beyond these lines.
   1. 1 foot-0 inches beyond face of structures and footings, in a vertical a mane as is safe against collapse.
   2. 6 inches below bottom of structures and footings.
   3. 2 feet-0 inches beyond inside diameter of pipes in as vertical a plane as is safe against collapse.
   4. 1 foot-0 inches below bottom of inside barrel of pipes.

3.10 DISPOSAL OF EXCESS OR UNSUITABLE MATERIALS

A. Excess excavation and unsuitable materials shall be legally disposed of off-site by the Contractor. Remove from the site as work progresses. Do not store excess excavation material or permit debris to accumulate on-site.

B. Remove from the site and dispose of legally all material unsuitable for fill or backfill, unless otherwise specified or directed by the Owner's Representative. The Contractor shall keep unsuitable uncontaminated materials separated from contaminated materials.

3.11 TESTING AND INSPECTION

A. Compaction testing: The Owner will employ and pay for independent testing laboratory services to perform compaction testing of subgrades, fills and granular materials.
   1. Notify the Owner and Laboratory 24 hours prior to the expected time for operations requiring inspection and testing services. Schedule compaction tests for every 4,000 square feet of fills placed 2' deep. (Approximately one test per every 300 cubic yards placed.) If tests indicate that required densities have not been achieved, continue compacting. All retesting in these areas shall be paid for by the Contractor.

2. Any additional Quality Assurance testing is the prerogative of the owner.

B. The Contractor shall provide the Owner with sieve analysis of all fill materials brought on-site, and for on-site materials used as fill.

END OF SECTION 31 20 00

SECTION 32 00 00
EXTERIOR IMPROVEMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

Standard Specification - The Standard Specifications for Roads, Bridges, and Incidental Construction, Supplement Form 818, dated January 2023 of the State of Connecticut, as specifically referenced to in the Technical Specifications, shall apply and be considered a part of this specification as though it were bound herein. The Standard Specification is available from: https://portal.ct.gov/DOT/IT/ConnDOT-Publications-Manuals

1.2 SUMMARY

A. Work Included: Providing all construction phasing, sequencing, and exterior improvements as shown on the Contract Drawings, and as specified, including , but not limited to the following:

1. Traffic Bound Gravel Surface
2. Cast-in-place concrete aprons.

1.3 QUALITY ASSURANCE

A. Materials and methods of construction shall comply with the following standards:
1. American Society for Testing and Materials (ASTM).
2. American Association of State Highway and Transportation Officials (AASHTO).
3. American Concrete Institute (ACI).
4. State of Connecticut, Department of Transportation Standard Specification Supplemented Form 818, January 2023.

1.4 SUBMITTALS

A. Concrete: Manufacturer's product date, test reports, and materials certifications for Cast-In-Place Concrete. Submit concrete mix designs for all types of concrete specified. Submit batch slips certifying concrete mix, air content, slump and time of loading.

B. Traffic Bound Gravel Surface: Sieve analysis from the gravel source.

C. Compaction test results.

1.5 EXAMINATION OF THE SITE

A. Data contained in Contract Documents (site survey, elevations, etc.) represents the best information available. There is no guarantee, implied or otherwise, as to the accuracy or completeness of the information shown. Contractor shall be constantly on the alert for unknown, abandoned or mis-located utilities and for changing soil or subsurface water conditions.

B. Prior to the start of construction the Contractor shall contact "Call Before You Dig" at 811, to locate and mark the exiting underground utilities in the work area

C. The Contractor shall examine carefully the site at which the work is to be performed, to satisfy himself as to the conditions to be encountered in the execution of the work.

D. Any conditions at the site of the contemplated work which are obvious and apparent upon examination of the site which were not indicated on the plans, but which the performance of the work called for by the plans and specifications would require the removal or correction thereof, shall be removed or corrected by the Contractor at no additional cost to the Owner.

1.6 PROTECTION

A. The Contractor shall execute the operations under his division in such a manner that no damage or injury occurs to the public, adjoining and adjacent property, structures, streets, paving, sewers, water, electric and any other pipes, mains, conduits, overhead or underground lines, utility and any and all property. Should any damage or injury be caused by the Contractor or by work under this contract, he shall make good such damage and assume all financial and other responsibility for injury. Damaged streets or paving excludes that necessary for installing new pipelines; however, such required damage shall be restored to the original condition existing before commencement of work under this contract.

B. The above shall also include the protection of all existing water mains, fire lines, utility poles, sanitary and storm sewers, culverts, and all other existing underground utilities which will remain in use within the boundary of the site and work areas.

C. Monuments, benchmarks and other reference features shall be protected. Should these be disturbed in any manner, they shall be replaced, but only in accordance with the written instructions of the Owner's representative.

1.7 SPECIAL REQUIREMENTS

A. Contact “Call-Before-You-Dig” at 811 at least 48 hours prior to the start of construction to mark underground utilities.

B. Verify and confirm all existing conditions and location of underground utilities in the field. No claim for extra compensation or for an extension of time will be allowed due to conditions inconsistent with the drawings and specification.

C. Restore any and all areas outside the contract limit lines that are disturbed during the progress of work as directed by the Engineer at the Contractor's expense.

D. Maintain existing roads passable for vehicles at all times. Access into the site is required by the Owner and shall be maintained by the Contractor.

E. All erosion and sedimentation control shall conform to "Connecticut Guidelines for Soil Erosion and Sediment Control;" by the Connecticut Council on Soil and Water Conservation, 2024.

F. Maintain access for firefighting equipment to all parts of the site at all times.

G. Protect all streets, roads and sidewalks and maintain reasonably clear of dirt or other debris that is due to construction. Apply water as necessary for dust control.

H. Coordinate work with the other Contractors for the building construction. Cooperate with such Contractor to ensure the steady progress of all work.

I. The Contractor shall be responsible for all construction stake-out as they require. Contractor to layout locations, lines, and grades of all site work using established permanent benchmarks and control points. Maintain and protect established bounds and benchmarks and replace any which are destroyed or disturbed.

J. In the event the Owner, or the Owner and the Contractor jointly are required to obtain any permits the Contractor shall familiarize himself with the conditions of said permits and shall be held to comply with all requirements of the permits and all specifications attached thereto, as if the permits were held solely by the Contractor.

1.8 ORDER OF CONSTRUCTION

A. Adapt all site work to the progress and order of construction of the work under this Contract. Carry out each section of work in such an order as depicted on the phasing plans or as the Owner may direct.

B. Construction Phasing Diagrams: The Contractor will provide construction phasing diagrams for proper execution of site work for approval by the Owner. Contractor shall strictly follow the phasing diagrams.

C. Schedule work to install any sub-surface site work before beginning the sub-grades for paved areas.

D. Submit schedule for review and acceptance by the Owner.

1.9 PROJECT CONDITIONS

A. Weather Limitations: Install materials only when base is dry and air temperature is 40 degrees F or above and when the temperature has not been below 32 degrees F for twelve hours prior to installation.

B. Grade Control: Establish and maintain the required lines and grades, including crowns and cross-slopes during construction activities.

C. Do not install pavements or sidewalks over frozen or saturated base material.

D. Protect adjacent work from damage, soiling, splattering or staining from construction activities.

PART 2 - PRODUCTS

2.1 PROCESSED STONE AGGREGATE BASE: Processed aggregate consisting of broken stone or coarse aggregate, conforming to Form 818, Article M.05.01.

2.2 TRAFFIC BOUND GRAVEL SURFACE: Gravel consisting of broken stone or coarse aggregate, conforming to Form 818, Article M.02.03.

2.3 CAST-IN-PLACE CONCRETE:

A. Conform to the requirements of Form 818, Section M.03.01.
1. Cast-in-place concrete shall be CTDOT “PCC4462” (4,400 psi.)
B. Entrained Air: 5% to 7%. A/E agent shall conform to ASTM c-260.
C. Slump: 3” maximum.
D. Water Reducing Admixture: ASTM c-494
E. Reactive agents and calcium chloride are not allowed.

2.4 STEEL REINFORCING: Conform to ASTM A-615, grade 60; epoxy coated deformed bars, true to length with ends square and free of burrs.

2.5 WELDED WIRE FABRIC: Welded plain cold drawn steel wire fabric for concrete reinforcement (ASTM A-185). Flat sheets required, 6x6-W1.4xW1.4 or as detailed.

2.6 EXPANSION JOINT FILLER: Performed Expansion Joint Filler shall comply with the provisions of ASTM D 1751 (AASHTO M 213).

2.7 DOWELS: If required, epoxy coated plain steel bars, including end caps.

PART 3 - EXECUTION

3.1 GENERAL EXAMINATION

A. Verify that the prepared subgrade, as detailed is true to line and grade, and is compacted to the required density. Surface to be smooth, free of irregularities, depressions, or unsuitable material which cannot compact or will become impervious. Insure proper drainage at all times. If required, form, shape and roll with 10-ton roller or equivalent.
B. Verify that frames for drainage and utility structures within the work areas are installed or reset to the proper elevations.
C. Verify that improvements and furnishings within the work areas are installed at their proper elevations.

3.2 TRAFFIC BOUND GRAVEL SURFACE

A. GRAVEL BASE & SURFACE
1. Spread processed stone base material uniformly using approved spreaders or stone boxes. The thickness of each course shall not be more than 4 inches after compaction. Extend base 8 inches beyond limits of all pavements.
2. Compact surface material with vibratory roller to minimum 98% of modified optimum density (ASTM D-1557). Compacting and binding operations shall conform to the requirements of Form 818, Article 3.04.03.

3.3 CAST-IN-PLACE CONCRETE APRONS

A. GENERAL
1. Install concrete aprons, dimensions and grades shown on the Drawings. At points where changes in rates of grades is more than 2%, introduce approved vertical curve. No abrupt changes in grade will be accepted.
2. Conform to the applicable provisions of Section 8.11 and Section 9.21 of DOT Form 818.

3. Insure that all improvements and related work are accurately and properly positioned to specified line and grade prior to concrete placement. Poor or incorrect positioning will cause rejection of pavement.

B. INSPECTION

1. Verify that the prepared subgrade or subbase, as detailed, is true to line and grade, and is compacted to the required density. Surface is to be smooth, free of irregularities, depressions or unsuitable material which cannot compact or will become impervious. Insure proper drainage at all times. If required, form, shape and roll with a 10 ton roller or equivalent.

C. GRANULAR BASE

1. Spread, shape, bind, wet and compact in accordance with Article 9.21.03 of DOT Form 818.

D. FORMS

1. Conform to Article 8.11.03-3 and Article 9.21.03-3 of Form 818. Forms shall be true to radius shown. Poorly formed curves will not be accepted. Approval of formwork required prior to pour.

E. EXPANSION JOINTS

1. Provide expansion joints wherever the pavement, curb or paver base slab abuts and building, structures, curbs, walls, columns, hydrants, and other fixed improvements, and as indicated on the Drawings, 20’ O.C. maximum. Approval of layout required prior to pour.
2. Install coated dowels and end caps at all expansion joints as detailed. Haunch pavement as detailed.
3. Joints shall be constructed true to line and grade; cleanly executed. Poorly aligned joints will not be accepted.
4. Position joint filler in accordance with the sealant manufacturer’s instructions.

F. REINFORCEMENT

1. Welded wire fabric (WWF): Place wire fabric with 3” edge laps. Fabric in slabs on grade shall be located not more than 2” below top of slab throughout by adequate means, other than pulling up.
2. Provide and place steel reinforcing as indicated. Properly locate and provide for the installation of inserts, dowels, metal ties, etc. and for the attachment of other work.

G. CONCRETE PLACEMENT

1. Comply with ACI 304 “Recommended Practice for Measuring, Mixing, Transporting, and Placing Concrete”, and as specified.

2. Protect concrete from physical damage or reduced strength due to weather extremes during mixing, placing, and curing. In cold weather comply with ACI 306, "Recommended Practice for Cold Weather Concreting". In not weather comply with ACI 305, "Recommended Practice for Hot Weather Concreting".
3. Thoroughly moisten base to provide a uniform dampened condition at the time concrete is placed. Verify manholes or other structures are at required finish elevation and alignment before placing concrete.
4. Place and spread concrete to the full depth of the forms. Use only square-end shovels or concrete rakes for hand-spreading and consolidating concrete. Exercise care during spreading and consolidating operations to prevent segregation of aggregate and dislocation of reinforcement.
5. Place concrete in a continuous operation between expansion joints. Provide construction joints when sections cannot be placed continuously.
6. Strike-off and bull-float concrete after consolidating. Level ridges and fill voids. Check surface with a 10'-10" straight edge. Fill depressions and refloat repaired areas. Darby the concrete surface to provide a smooth level surface ready for finishing.
7. Work the external surface of vertical faces to force the coarse aggregate from the surface and thoroughly work the mortar against the forms. Conform to Article 9.21.03 of Form 818 for float finish.

H. TOOLED JOINTS

1. Cut between the expansion joints; to create equally dimensioned panels. Maximum spacing 6'0". Areas of concrete sidewalk replacement shall be patterned to match the existing pavement. Joints shall be straight or true to radius shown, cleanly executed. Poor workmanship will cause rejection of the walk.
2. Cut while the concrete is workable. Avoid depressing wings of scoring tool into joint. Trowel out any wing marks.

I. FINISH

1. Exposed flat surfaces shall be soft broom finished perpendicular to long axis of pavement as approved in sample panel.
2. Areas of any concrete pavement replacement shall match the finish of the adjacent pavement.
3. At handicap ramps, provide heavy bristle finish with marks perpendicular to the surface drainage of the ramp.

J. CURING

1. Concrete shall be cured and protected as specified in accordance with Article 9.21.03 of DOT Form 818. Conform to curing compound producer's instructions.

2. Cold Weather Protection: The Contractor shall provide protection against low temperatures during the curing period. Place a layer of hay or straw 8 inches thick over the entire surface upon which shall be placed another layer of mats.

K. CONCRETE SEALER

1. After concrete has cured for a minimum of 28 days, all exposed concrete surfaces shall be sealed with a spray on or roll on water based non-slip salt guard suitable for use on sidewalks installed per the manufacturer's recommendations. Adjustments to the cure duration may be made with prior approval from the Engineer and Manufacturer.

L. PROTECTION/CLEANUP

1. Thoroughly clean all surfaces and keep clean until the completion of the project. Remove from site all excess materials, debris, and equipment.
2. Protect concrete until completion of the Contract. Repair/replace damaged areas as directed. Prevent all construction and vehicular traffic for a minimum of 14 days after pour.
3. Do not backfill against pavements until materials can be placed and compacted without damaging the concrete.

3.7 CLEAN-UP

A. Perform cleaning during installation of the work and upon completion of the work. Remove from site all excess materials, debris, and equipment. Repair damage resulting from paving or concrete operation.

END OF SECTION 320000

SECTION 32 30 00
SITE IMPROVEMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

Standard Specification - The Standard Specifications for Roads, Bridges, and Incidental Construction, Supplement Form 818, dated January 2023 of the State of Connecticut, as specifically referenced to in the Technical Specifications, shall apply and be considered a part of this specification as though it were bound herein. The Standard Specification is available from: https://portal.ct.gov/DOT/IT/ConnDOT-Publications-Manuals

1.2 SUMMARY

A. Work Included: Providing all site improvements as shown on the Contract Drawings, and as specified, including , but not limited to the following:

1. Installation of bollards.
2. Modular concrete block retaining wall.
3. Miscellaneous cast-in-place concrete.

1.3 SUBMITTALS

A. Contractor shall submit shop drawings bollards and modular concrete block retaining wall.

B. Contractor shall submit Manufacturer's product date, test reports, and materials certifications for cast-in-place concrete. Submit concrete mix designs for all types of concrete specified. Submit batch slips certifying concrete mix, air content, slump and time of loading.

PART 2 - PRODUCTS

2.1 CAST-IN-PLACE CONCRETE

A. Cast-in-place concrete shall be Class “PCC4462” concrete conforming to Section M.03.01 of Form 818.

2.2 REINFORCING STEEL

A. Reinforcing steel shall conform to Section M.06.01 of Form 818.

2.3 GRAVEL FILL

A. Gravel fill shall conform to section M.02.01 and the requirements of material grading A as defined in section M.02.06 of Form 818.

2.4 CRUSHED STONE

A. Crushed stone shall conform to section M.01.02 of Form 818.

2.5 BOLLARDS

A. Bollards shall conform to the details shown on the Contract Drawings.

2.6 MODULAR CONCRETE BLOCK WALL

A. Shall be precast concrete blocks, approximately 4’-0” x 2’-0” x 2’-0” with a cut rock face form liner façade.
B. The wall system shall have top block suitable for backfilling with topsoil and seed to the wall face.
C. Block shall be EZ-Block as manufactured by United Concrete or approved equal.

PART 3 - EXECUTION

3.1 CAST-IN-PLACE CONCRETE

A. Construction methods shall conform to Article 6.01.03 of Form 818 as applicable.

3.2 BOLLARDS

A. Bollards shall be constructed in the location and to the dimensions shown on the plans or as ordered.

3.5 MODULAR CONCRETE BLOCK WALL

A. The modular concrete block retaining wall shall be constructed in the location and to the dimensions shown on the plan, and in accordance with the Manufacturers requirements.

END OF SECTION 32 30 00

SECTION 32 92 00
TURF AND GRASSES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The Drawings and general provisions of the Contract, including General and Supplementary Conditions, and General Requirements apply to work specified in this Section.

1.2 SECTION INCLUDES

A. The topsoil, seed, fertilizing and mulching work shall consist of all labor, equipment and services required to complete all of the work called for on the Contract Drawings and these specifications.
B. Provide erosion control matting for steep slopes as outlined in the Contract Drawings.
C. Prepare and seed the topsoiled areas and establish a stand of grass to stabilize all disturbed areas, acceptable to the Engineer
D. Maintain seeded areas until acceptance.

1.3 SUBMITTALS

A. Topsoil test results for approval prior to spreading.
B. Species breakdown for specified seed mixtures.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Deliver seed in original containers showing guaranteed analysis of seed mixture, percentage of pure seed, year of production, net weight, date of packaging, and location of packaging.
B. Damaged packages are not acceptable.

PART 2 - PRODUCTS

2.1 TOPSOIL

A. Topsoil shall conform to section M13.01-1 of Form 818.
B. Pervious topsoil mix shall conform to the requirements outlined on the Contract Drawings.

2.2 SEED

A. Seed for temporary vegetative cover shall be rye grass as specified on the plans.
B. Seed for all disturbed areas shall be as shown on the Contract Drawings.

2.3 FERTILIZER

A. Fertilizer shall conform to the requirement of Article M.13.03.

2.4 MULCH

A. Mulch shall conform to Article M.13.05-1 and shall be hay or wood fiber.

2.3 SLOPE STABILIZATION / EROSION CONTROL MATTING

A. Erosion Control Matting shall be North American Green Bionet C125BN or equal approved by the Engineer.

PART 3 - EXECUTION

3.1 TESTING AND SPREADING TOPSOIL

A. Test, screen, and spread topsoil on all disturbed areas within the contract limit line upon which construction does not occur.

B. At Contractor's expense, test representative samples of stockpiled topsoil and any borrow topsoil. Provide mechanical analysis and pH value. Topsoil shall conform to the requirements of Article M.13.01-1 of DOT Form 816.

C. Provide subgrade 4 inches below finish grade elevation for lawns. Loosen subgrade by disking or scarifying to a depth of 2 inches minimum where compaction has occurred. Clear surface of all stumps, stones, or roots 2 inches in diameter or greater; cable, wire, grade stakes, and any other materials, which might hinder proper tillage or spreading. Obtain approval of the subgrade from the Engineer before applying topsoil.

D. Spread topsoil uniformly to finish grades. Do not spread or work when topsoil or subgrade are frozen, muddy, or excessively dry. Place only when seeding and sodding operations can follow within a reasonable time.

E. Remove weeds above 1 inch in height prior to seeding and sodding operations. Do not allow weeds to go to seed. Keep heavy equipment, trucks, etc., off of topsoiled areas.

If compaction occurs, scarify to a depth of 4 inches. Maintain finish grades by adding topsoil in eroded or settled areas.

3.2 RATE OF APPLICATION

A. The rate of application for each seed mixture shall be as specified on the plans.

3.3 HYDRAULIC SEEDING

A. Mix materials with water. Keep in an agitated state so that the materials are uniformly suspended in the water.

B. Spraying equipment shall be so designed that when the solutions are sprayed over an area, the resulting deposits of lime, fertilizer, grass seed, and mulch shall be equal, in quantity to those specified.

C. Before commencing work, submit to the Engineer a certified statement of the quantities of materials per 100 gallons of water, and the area that this quantity can cover.

3.4 MECHANICAL SEEDING

A. Apply lime and fertilizer evenly at rates determined by topsoil test results and thoroughly incorporate into the upper 4 inches of topsoil.

B. Rake finished surface smooth.

C. Sow seed applying half the quantity in one direction and the remaining quantity at right angles to it. Do not sow seed on a windy day, or when the ground is frozen, wet, or otherwise non-tillable.

D. Cover seed with a thin layer of topsoil by raking or dragging.

E. Roll with a hand roller not heavier than 300 lbs.

F. Maintain a moist seedbed at all times. Water seed bed so that the topsoil is wet to a depth of 2 inches. Apply one complete coverage to the seeded area in an 8-hour period.

G. Protect the seedbed with barricades, where necessary, to keen all traffic off the area.

H. After the grass has appeared, reseed all areas, which have failed to show a uniform stand of grass.

3.5 SLOPE STABILIZATION

A. All slopes 3H:1V or greater shall be stabilized per the slope stabilization detail shown on the Contract Drawing.

3.6 CLEAN UP

A. Dispose of excess materials and debris resulting from seeding work off-site.

B. Leave work areas clean and neat upon completion of the work.

3.7 MAINTENANCE

A. Period Required: Immediately after seeding and continue until area is stabilized and accepted by the Engineer.

B. Perform all reseeding, watering, mowing, weeding and rolling, insect or disease control, refertilizing, and repair of washouts if necessary.

C. Water minimum 3 times per week so that the depth of moisture is minimum 4 inches.

D. When average height of grass becomes 3 1/2 inches, mow to the height of 2 1/2 inches. Remove heavy clippings, minimum 2 mowings.

3.8 INSPECTION AND ACCEPTANCE

A. Submit written notice requesting inspection by the Engineer at least 10 days prior to the anticipated date.

B. No grass area will be inspected for acceptance: prior to the completion of this Contract; minimum 30 days from date of seeding prior to the completion of 2 mowings.

C. An acceptable seeded grass area shall consist of a uniform stand of at least 60% established permanent grass species, with a uniform count of at least 100 plants per square foot.

D. Unacceptable seeded areas shall be reconstructed under the direction of the Engineer.

E. The Engineer and/or Owner shall be the judge of acceptance.

END OF SECTION 32 92 00

SECTION 33 05 05
BURIED PIPE INSTALLATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

Standard Specification - The Standard Specifications for Roads, Bridges, and Incidental Construction, Supplement Form 818, dated January 2023 of the State of Connecticut, as specifically referenced to in the Technical Specifications, shall apply and be considered a part of this specification as though it were bound herein. The Standard Specification is available from: https://portal.ct.gov/DOT/IT/ConnDOT-Publications-Manuals

1.2 SUMMARY

A. Buried pipe installation shall include, but is not necessarily limited to the following:
1. Layout and stake proposed work and set required elevations.
2. Trench excavation, bedding and backfill necessary to install site drainage, structures and other improvements.
3. Remove excavated material unsuitable for fill or backfill for trenches and any excess trench material with legal disposal on site or offsite.

1.3 SUBMITTALS

A. Analysis from approved independent testing laboratory showing that bedding materials, processed aggregate, gravel and stone and aggregate materials comply with specified requirements.

B. Compaction test results.

1.4 DEFINITIONS

A. Subgrade: The undisturbed earth or the compacted soil layer immediately below granular subbase, drainage fill, or topsoil materials.

B. Structure: Buildings, foundations, slabs, tanks, curbs, or other man-made stationary features occurring above or below ground surface.

C. Earth excavation: The removal of all materials other than "rock".

D. Rock: A boulder of 2 cubic yards or more in volume and rock in definite ledge formation, the removal of which requires the use of mechanical equipment. Rock removed by scarification or ripping method is considered as a separate classification.

E. Original grade: The grade, which exists at the time of the Contract award.

F. Rough grade: The completed surface of required excavations greater than 13' in width.

G. Trench excavation: The removal of material from areas 13 feet or less in its minimal horizontal dimensions and below the elevation of rough grade or original grade, whichever is lower.

1.5 PROTECTION

A. Protect excavations by shoring, bracing, sheet piling, underpinning, or other methods necessary to prevent cave-in or loose soil from falling into excavation. Shoring and bracing shall be entirely independent of footings and foundations and shall not thrust against any portion of the structure.

B. Underpin adjacent structures that may be damaged by excavation work, including service utilities and pipe chases.

C. Notify Engineer of unexpected subsurface conditions and discontinue effected work in area until condition is resolved.

D. Protect bottom of excavations and soil adjacent to and beneath foundations and bottom of trenches against freezing when atmospheric temperature is less than 35 degrees F.

E. Do not allow water to accumulate in excavations. Remove water to prevent softening of foundation bottoms, undercutting footings, and soil changes detrimental to stability of subgrades and foundations. Provide and maintain pumps, well points, sumps, suction and discharge lines, and other de-watering system components necessary to convey water away from excavations.

1.6 FIELD INSPECTION AND TESTING

A. The Contractor will retain and pay for an independent soil laboratory to perform inspection and testing of fill and other soil products as deemed necessary.

B. Work required to correct faulty operation shall be at the Contractor's expense. Retesting will be by the Contractor, and the Contractor shall pay costs.

PART 2 - PRODUCTS

2.1 BACKFILL

A. Provide material free of organic or perishable material and without stones larger than 3 1/2 inches, with less than 10% by weight passing a No. 200 sieve.

B. Do not backfill with material which does not meet the above requirements. Furnish and satisfactorily place material conforming to "Borrow" Section 2.07.01 and 2.07.02 of Form 818.

2.2 SAND BEDDING

A. Sand bedding shall consist of sand or sandy soil, all of which passes a 3/8 inch sieve, and not more than 10% of which passes a No. 200 sieve. Existing material may be used if it complies.

2.3 STONE BEDDING

A. Stone bedding shall conform to section M.01.02 of Form 818, No. 6.

2.4 FILTER FABRIC

A. Filter fabric shall conform to section M.08.01-19 of Form 818.

2.5 GRAVEL FILL

A. Gravel fill shall conform to section M.02.01 and requirements of material grading A as defined in M.02.06 of Form 818.

PART 3 - EXECUTION

3.1 ENGINEERING AND SURVEY WORK

A. Contractor to layout all work shown on drawings. Furnish all engineering services required. Provide a registered engineer or licensed surveyor to lay out the initial stakes. Maintain and protect or replace stakes as required. Stake the proposed entrance drives, parking areas, and set finish elevations. Tie in control points so as to permit any portion of the layout to be reestablished without a complete survey.

3.2 TRENCH EARTH EXCAVATION AND BACKFILL

A. Excavate pipes and structures to the widths and depths shown on drawings or as specified. Keep sides as vertical as practical. Comply with Federal, State, town, and local specifications

B. Furnish all shoring and bracing necessary for the completion of the work. Keep excavations dry. Do not excavate to full depth in freezing temperature unless pipes, structures, and footings are installed immediately. Where accidental excavations cause material removal below the required grade for proposed pipes and structures, backfill with gravel fill up to the required grade.

C. Provide storm drainage, sanitary sewer, or other gravity flow piping trenches with continuous slope in direction of flow.

D. Bedding shall be sand, sandy soil or gravel fill unless otherwise shown on the drawings. Construction methods for bedding and backfilling shall conform to Section 6.86.03 of Form 818.

E. Backfill in layers not exceeding 12 inches in depth. Conform to Section 2.86.03 of Form 818. Do not backfill against any pipe, structure or footing until permission is given by the Engineer.

F. Compact to 95% Modified AASHTO laboratory density (ASTM D-1557, Method C.)

G. If pipes or structures are over fill areas, fill 12 inches higher than the top and compact to density required. Trench to required elevation. Extend fill and compaction at least 2 feet laterally on both sides or proposed pipe or structure

3.3 EXCAVATION PROTECTION AND MAINTENANCE

A. Protect open excavations with fencing, warning lights, and/or other suitable safeguards.

B. Shore, sheet, or brace excavations and trenches as required to maintain them secure and to protect adjacent existing structures. Remove shoring as the backfilling progresses, but only when banks are safe against caving or collapse.

C. Provide, maintain, and operate pumps and related equipment, including stand-by equipment, of sufficient capacity to keep excavation free of water at all times, and under any and all contingencies that may arise until the structures attain their full strength. Notify the Engineer and receive approval before discontinuance of pumping. Maintain ground water in bearing strata at a safe level at all times by methods, which prevent loss of fines or other disturbances to the strata. If methods employed have not been adequate

and the bearing value of the soil has been reduced, carry out remedial measures as directed by the Engineer. Keep trenches free of water until trenches have been backfilled.

D. Dispose of water through temporary pipe lines with outfall as shown on the plans. Prevent erosion of surrounding areas. At completion of de-watering, remove temporary facilities and restore subgrade and any damaged areas.

3.4 TRENCH ROCK EXCAVATION

A. Remove and legally dispose of, off site, rock if encountered, as defined below when encountered.
   1. All solid rock, pavements, or structures that require breaking by hand power tools (jackhammers, etc.) prior to removal.
   2. Boulders, pavements, or structures measuring 2 cubic yard or more that require breaking for removal.

B. Blasting if required shall conform to Article 1.20-1.07.08 of Form 818 and all Federal, State, and Local regulations.

C. Excavate rock within the following limits. No payment will be made for rock removal beyond these lines.
   1. 1 foot-0 inches beyond face of structures and footings, in a vertical a mane as is safe against collapse.
   2. 6 inches below bottom of structures and footings.
   3. 2 feet-0 inches beyond inside diameter of pipes in as vertical a plane as is safe against collapse.
   4. 1 foot-0 inches below bottom of inside barrel of pipes.

END OF SECTION 33 05 05

SECTION 33 10 00
WATER UTILITIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

Standard Specification - The Standard Specifications for Roads, Bridges, and Incidental Construction, Supplement Form 818, dated January 2023 of the State of Connecticut, as specifically referenced to in the Technical Specifications, shall apply and be considered a part of this specification as though it were bound herein. The Standard Specification is available from: https://portal.ct.gov/DOT/IT/ConnDOT-Publications-Manuals

1.2 SUMMARY

A. Water Utilities shall include, but is not necessarily limited to, the following:
   1. Provide water irrigation service piping and all required fittings as shown on the Contract Drawings

1.3 SUBMITTALS

A. Shop drawings for pipe and fittings.

B. As Built Drawings: Record on a print, all deviations from Contract requirements. Record final and actual sizes, locations, and elevations of all components. As-Built Drawings shall be submitted to the Owner at the completion of construction.

PART 2 - PRODUCTS

All materials specified shall be new and unused and meet the requirements specified herein and as required and approved by the controlling water authority.

A. Water Service Piping:
   1. Polyethylene pressure pipe for water services shall meet the requirements of AWWA C901 (Latest Revision). The material must be listed and approved for potable water in accordance with NSF Standard 14 & 61. PE pipe shall be pressure rated to 200 psi minimum. PE pipe shall be Copper Tube Size (CTS).

B. Polyethylene fittings shall be rated for 200 psi applications minimum. Polyethylene fittings shall conform to ASTM Standard Specification for Pressure Rated Pipe ASTM-2737.

C. Three-quarter inch crushed stone shall meet the gradation requirements specified for Stone and Gravel in Article M.01.01 of the Standard Specification.

D. Concrete for thrust blocks and pipe encasement shall be as specified in Article M.03.01 - Class "PCC4462" of the Standard Specifications.

PART 3 - EXECUTION

A. Trench excavation and backfill shall meet the requirements of the trench excavation section of this specification. Pipe bedding shall conform to the Contract Drawings

B. The Contractor shall be responsible for all materials and work required for water service installations, but he shall coordinate all activities with the Public Works. When temporary discontinuance of service is required to accomplish service replacement or reconnection the Contractor shall give ample notice to Public Works so that they can notify the customer one working day in advance of the discontinuance. He shall have all materials on hand necessary to do the work and shall perform as much excavation and installation of new materials as possible in advance to minimize the time water will be shut off.

C. The interior of the pipe shall be thoroughly cleaned of foreign matter before being lowered into the trench and shall be kept clean during laying operations by plugging or other approved method. Pipe shall not be laid in water, or when trench or weather conditions are unsuitable for the work. When work is not in progress, open ends of pipe and fittings shall be securely closed so that no trench water, earth or other substance will enter the pipes or fittings and no seal or plug shall be removed until trench is pumped completely dry. All defective and unsound material found to be defective before or after installation will be rejected and shall be replaced by the Contractor with new sound and approved material, at no additional expense to the Owner. All connections shall only be made at such times and in a manner approved by the Owner.

D. The exact locations of connections shall be as directed by the Owner. In addition to the requirements specified herein, the piping and appurtenances shall be provided in accordance with the printed recommendations of the respective manufacturer and as approved. Piping, stops, fittings, specials and associated work shall be provided as indicated, as specified and as necessary to conform with the lines, grades and arrangement as directed by the Owner and for the proper and satisfactory fitting and completion of the work, and as directed. The Contractor shall be responsible for verifying in the field all lines, grades, dimensions and conditions affecting the work, and for the correct fitting of all parts of the water service lines and appurtenances in the completed water services prior to the ordering or fabrication of the various

materials. Deflections from a straight line or grade, as required by vertical curves, horizontal curves or offsets shall be made using fittings or specials as indicated and/or as directed; the types of fittings or specials used shall be as approved. No connections or joints shall be covered in any way until the connections have been inspected.

E. Polyethylene (P.E.) tubing shall be installed as shown on the plans, and in conformity with accepted best practice.

END OF SECTION 33 10 00

SECTION 33 70 00
ELECTRICAL UTILITIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

A. The Drawings and general provisions of the Contract, including General and Supplementary Conditions, and General Requirements apply to work specified in this Section.

1.2 DESCRIPTION:

A. Work Included: This work shall consist of all labor, equipment and services required to complete all of the work called for on the Contract Drawings and these specifications.

B. The work shall include, but is not limited to:
   1. The installation of electrical conduits and duct banks.
   2. The installation of telecommunications conduits and duct banks.
   3. The installation of electrical service panels.
   4. The installation of electrical outlets and conduits.
   5. The installation of lighting.
   6. Installation of automatic overhead door openers.

1.3 REFERENCES

A. ANSI/NFPA 70 - National Electrical Code.
B. NFPA- Life Safety 101: NFPA Codes- All
C. BOCA- National Building Code
D. Local codes and Authority Having Jurisdiction

1.4 QUALITY ASSURANCE:

A. Codes and Standards: All work under this section shall comply with the applicable requirements of the National Electric Code, local electrical and other codes, laws, regulations and standards including those of all State authorities. Where references are made in law codes regulation and standards, these documents, including the latest revisions and amendments in effect as of the date of bid opening, shall form part of these specifications.
B. Conform to applicable State of Conn Building Codes.
C. Electrical: Conform to NFPA 70.

1.5 SUBMITTALS

A. Shop drawings for conduit and fittings.
B. Shop drawings for light fixtures and fittings, posts, and hangers.
C. Shop drawings for all electrical outlets and surface mounted conduit and fittings
D. Shop drawings for automatic overhead door openers, equipment, and hangers.
E. Electrical system design shall be submitted to the Building Department for review and approval as part of the building permit process.

1.6 EXCAVATION AND BACKFILLING

A. Excavation and backfill shall conform to the applicable section of these specifications.

1.7 PROJECT CONDITIONS

A. Verify underground utility locations prior to beginning work. Adjust post locations as necessary.

PART 2 - PRODUCTS

2.1 GENERAL

A. Provide only materials that are new and of type and quality specified, or approved equal. Where Underwriters' Laboratories, Inc. has established standards for such materials, provide only materials bearing the UL label.

B. Unless otherwise indicated, all raceways for service, feeders, branch and control wiring are RSC or IMC.

C. Unless otherwise indicated, wiring to equipment and motors shall be installed in liquid-tight flexible conduit, or in interior dry locations in flexible metal conduit, with a maximum length of six (6) feet.

D. Unless otherwise indicated, all conductors to be copper THHN/THWN-2.

E. Unless otherwise indicated, all outlet and switch boxes to be cast iron with threaded hubs.

F. In interior protected locations, where recessed in ceiling and walls, outlet and switch boxes may be stamped steel.

G. Unless otherwise indicated, provide heavy duty grade, 20 ampere, receptacles and switches. Provide associated cover plates. Plates for surface mounted interior boxes in unfinished areas shall be stamped steel. Plates exposed to weather or water to be metal, weatherproof type.

2.2 Conduits

a. Metal Conduit and Tubing
   1. Rigid Steel Conduit: ANSI C80.1.
   2. Intermediate Steel Conduit: UL 1242.
   3. Electrical Metallic Tubing and Fittings: ANSI C80.3
   4. Flexible Metal Conduit: UL 1, zinc coated steel.
   5. Liquid-tight Flexible Metal Conduit and Fittings: UL 360. Fittings shall be specifically approved for use with this raceway.

b. Nonmetallic Conduit and Ducts
   1. Rigid Nonmetallic Conduit: NEMA TC 2 and UL 651, Schedule 40 or 80 PVC.
   2. PVC Conduit and Tube Fittings: TC 3; match to conduit or conduit/tube type and material.
   3. Conduit, Tubing and Duct Accessories: Types, sizes and materials complying with manufacturer's published product information. Mate and attach to raceway.

c. Conduit Bodies
   1. General: Types, shapes, and sizes as required to suit individual applications and NEC requirements. Provide matching gasketed covers secured with corrosion resistant screws.
   2. Metallic Conduit and Tubing: Use metallic conduit bodies. Use bodies with threaded hubs for threaded raceways.
   3. Conduit Bodies 1 Inch and Smaller: Use bodies with compression type threaded connectors.
   4. Nonmetallic Conduit and Tubing: Use nonmetallic conduit bodies conforming to UL 514B

d. Wireways
   1. General: Electrical wireways shall be of types, sizes, and number of channels indicated. Fittings and accessories including couplings, offsets, elbows, expansion joints, adapeters, hold-down straps, and end caps shall match and mate with wireway as required for completed system. Where features are not indicated, select to fulfill wiring requirements and comply with applicable provisions of NEC.
   2. Wireway covers to be hinged type.

e. Cabinets, Boxes and Fittings, General
   1. Electrical Cabinets, Boxes, and Fittings: Of indicated types, sizes, and NEMA enclosure classes. Where not indicated, provide units of types, sizes, and classes appropriate for the use and location. Provide all items complete with covers and accessories required for the intended use. Provide gaskets for units in damp or wet locations.
   2. Materials and finish
      a. Sheet Steel: Flat rolled, code gage, galvanized steel.
      b. Fasteners for General Use: Corrosion resistant screws and hardware including cadmium and zinc plated items.
      c. Fasteners for Damp or Wet Locations: Stainless steel screws and hardware.
      d. Cast Metal for Boxes, Enclosures, and Covers; Copper free aluminum except as otherwise specified.
      e. Exterior Finish: Gray baked enamel for items exposed in finished locations except as otherwise indicated.
      f. Painted Interior Finish: Where indicated, white baked enamel.
      g. Fittings for Boxes, Cabinets, and Enclosures: Conform to UL 514B. Malleable iron or zinc plated steel for conduit hubs, bushings and box connecters.

f. Metal Outlet, Device and Small Wiring Boxes
   1. General: Conform to UL 514A, "Metallic Outlet Boxes, Electrical," and UL 514B, "Fittings for Conduit and Outlet Boxes." Boxes shall be of type, shape, size, and depth to suit each location and application.
   2. Steel Boxes: Conform to NEMA OS 1, "Sheet Steel Outlet Boxes, Device Boxes, Covers, and Box Supports." Boxes shall be sheet steel with stamped knockouts, threaded screw holes and accessories suitable for each location including mounting brackets and straps, cable clamps, exterior rings and fixture studs.
   3. Cast Iron Boxes: Iron alloy, waterproof, with threaded raceway entries and features and accessories suitable for each location, including mounting ears, threaded screw holes for devices and closure plugs.

g. Pull or Junction Boxes
   1. General: Comply with UL 50, "Electrical Cabinets and Boxes", for boxes over 100 cubic inches volume. Boxes shall have screwed or bolted on covers of material same as box and shall be of size and shape to suit application.
   2. Steel Boxes: Sheet steel with welded seams. Where necessary to provide a rigid assembly, construct with internal structural steel bracing.
   3. Hot Dipped Galvanized Steel Boxes: Sheet steel with welded seams. Where necessary to provide a rigid assembly, construct with internal

structural steel bracing. Hot dip galvanized after fabrication. Cover shall be gasketed.

4. Stainless Steel Boxes: Fabricate of stainless steel conforming to Type 302 of ASTM A 167, "Specification for Stainless and Heat Resisting Chromium Nickel Steel Plate, Sheet, and Strip." Where necessary to provide a rigid assembly, construct with internal structural stainless steel bracing. Cover shall be gasketed.
5. Cast Iron Boxes: Molded of cast iron alloy with gasketed cover and integral threaded conduit entrances.

j. Raceway Wiring Method
   1. Outdoors: Use the following wiring methods:
      a. Exposed / Concealed: Rigid metal conduit, Intermediate metal conduit.
      b. Underground: Rigid metal conduit, Schedule 40/80 PVC.
      c. Connection to Vibrating Equipment: Including transformers and hydraulic, pneumatic, or electric solenoid or motor driven equipment: liquid-tight flexible metal conduit. Maximum length six (6) feet.
   2. Indoors: Use the following wiring methods:
      a. Exposed/Concealed feeders: Intermediate metal conduit, Rigid metal conduit.
      b. Connection to vibrating equipment and hydraulic, pneumatic, or electric solenoid or motor driven equipment in moist or humid location or corrosive atmosphere, or where subject to water spray or dripping oil, grease, or water: Liquid tight flexible metal conduit. Maximum length six (6) feet.

2.3 Wire and Cables

a. General
   1. General: Provide wire and cable suitable for the temperature, conditions and location where installed.
   2. Conductors: Provide stranded conductors for power and lighting circuits no. 10 AWG and smaller. Provide stranded conductors for sizes no. 8 AWG and larger.
   3. Conductor Material: Copper for all wires and cables.
   4. Conductor sizes indicated are based on copper.
   5. Insulation: Provide THHN/THWN-2 insulation for all conductors size 500MCM and larger, and no. 8 AWG and smaller. For all other sizes provide, THHN/THWN-2 or XHHW insulation as appropriate for the locations where installed.
   6. Color Coding for phase identification in accordance with Table 1 below. TABLE 1:

1. Color code secondary service, feeder, and branch circuit conductors with factory applied color as follows:

120/240Volts	Phase	120/208Volts
Black	A	Black
Red	B	Red
NA	C	Blue
White	Neutral	White
Green	Ground	Green

7. Jackets: Factory applied nylon or PVC external jacketed wires and cables for pulls in raceways over 100 feet in length, for pulls in raceways with more than three equivalent 90 deg. bends, for pulls in conduits underground or under slabs on grade, and where indicated.

b. Connectors for Conductors
   1. Provide UL listed factory fabricated, solderless metal connectors of sizes, ampacity ratings, materials, types and classes for applications and for services indicated. Use connectors with temperature ratings equal to or greater than those of the wires upon which used.

c. Wiring Method
   1. Use the following wiring methods as indicated:
      a. Install all wire in raceway.
      b. Provide E-Y Fitting where required by NEC.

d Installation of Wires and Cables
   1. General: Install electrical cables, wires, and connectors in compliance with NEC.
   2. Coordinate cable installation with other Work.

3 Wiring Devices

a. General
   1. Provide wiring devices, in types, characteristics, grades, colors, and electrical ratings for applications indicated which are UL listed and which comply with NEMA WD 1 and other applicable UL and NEMA standards. Devices and wall plates colors by Architect/Owner.
   2. Receptacles: As scheduled in Table 1 in 5.c below. Comply with UL 498 and NEMA WD 1.
   3. Ground Fault Circuit Interrupter (GFCI) Receptacles: Provide "feed thru" type ground fault circuit interrupter, with integral heavy duty NEMA 5 20R duplex receptacles arranged to protect connected downstream receptacles on same circuit. Provide unit designed for installation in a 2 3/4 inch deep outlet box without adapter, grounding type, Class A, Group 1, per UL Standard 94.3.

4. Snap Switches: quiet type AC switches as indicated in Table 2 in 5.c below. Comply with UL 20 and NEMA WD1.

b. Wiring Device Accessories
   1. Wall plates: single and combination, of types, sizes, and with ganging and cutouts as indicated. Provide plates which mate and match with wiring devices to which attached. Provide metal screws for securing plates to devices with screw heads colored to match finish of plates. Provide wall plate color to match wiring devices except as otherwise indicated. Provide plates possessing the following additional construction features:
      a. Material and Finish: steel plate, galvanized, for building mechanical spaces.

TABLE 1

RECEPTACLES

DESIGNATION (1)	CURRENT RATING AMPS	VOLTAGE RATING	SINGLE/ DUPLEX	NEMA CONFIGURATION	UL GRADE	NOTES
-	20	125	DUPLEX	5 20R	SPEC GRADE	
GFCI	20	125	DUPLEX	5 20R	SPEC GRADE	INTEGRAL GFCI
GFCI WP	20	125	DUPLEX	5 20R	SPEC GRADE	INTEGRAL GFCI WEATHER-PROOF

NOTES

(1) Letter designations are used where symbols alone do not clearly designate on plans locations where specific receptacle types are used.

TABLE 2

SNAP SWITCHES

DESIG-NATION (1)	TYPICAL APPLICATION	VOLTAGE LOAD RATING	RATING (AC)	POLES	UL GRADE	NOTES
S	CONTROL LIGHTS	20A	120/277	1	HEAVY DUTY	-
S3	CONTROL LIGHTS	20A	120/277	3-way	HEAVY DUTY	-
S	DISCONN. MOTOR	1HP	120/277	1	HEAVY DUTY	(2)
STOL	DISCONN. MOTOR	2HP	208/480	3	HEAVY DUTY	(2)

NOTES

(1) For snap switches, designation is the same as the symbol used on plans for the device. Type of switch is determined from plan context including type of device or circuit being controlled.
(2) With overload element in switch.

2.4 Grounding

1. Grounding and Bonding Products
   a. Products: Of types indicated and of sizes and ratings to comply with NEC. Where types, sizes, ratings, and quantities indicated are in excess of NEC requirements, the more stringent requirements and the greater size, rating, and quantity indications govern.
   b. Conductor Materials: Copper.
2. Wire and Cable Conductors
   a. General: Conform to NEC Table 8, except as otherwise indicated, for conductor properties, including stranding.
   b. Equipment Grounding Conductor: Green insulated.
   c. Grounding Electrode Conductor: Stranded cable.
   d. Bare Copper Conductors: Conform to the following:
      1. Assembly of Stranded Conductors: ASTM B 8.
3. Miscellaneous Conductors
   a. Ground Bus: Bare annealed copper bars of rectangular cross section.
   b. Braided Bonding Jumpers: Copper tape, braided No. 30 gage bare copper wire, terminated with copper ferrules.
   c. Bonding Strap Conductor/Connectors: Soft copper, 0.05 inch thick and 2 inches wide, except as indicated.

4. Connector Products
   a. General: Listed and labeled as grounding connectors for the materials used.
   b. Pressure Connectors: High conductivity plated units.
   c. Bolted Clamps: Heavy duty units listed for the application.
   d. Exothermic Welded Connections: Provided in kit form and selected for the specific types, sizes, and combinations of conductors and other items to be connected.
   e. Aluminum To Copper Connections: Bimetallic type, conforming to UL 96, "Lighting Protection Components," or UL 467.
5. Grounding Electrodes
   a. Ground Rods: Copper clad steel with high strength steel core and electrolytic grade copper outer sheath, molten welded to core.
      1. Size: 5/8 inch by 8 feet.
         3/4 inch by 10 feet.
   b. Plate Electrodes: Copper plates, minimum 0.10 inch thick, size as required per N.E.C. indicated.
6. Applications
   a. Equipment Grounding Conductor Application: Comply with NEC Article 250 for sizes and quantities of equipment grounding conductors, except where larger sizes or more conductors are indicated.
      1. Install separate insulated equipment grounding conductors with circuit conductors for the following in addition to those locations where required by Code: Lighting circuits, Feeders and branch circuits, Receptacle Circuits, Single phase motor or appliance circuits, Three phase motor or appliance branch circuits.

2.5 Electrical Panelboard
1. Panelboards, General Requirements
   a. Overcurrent Protective Devices (OCPDs): Provide type, rating, and features as indicated. Tandem circuit breakers shall not be used. Multipole breakers shall have common trip.
   b. Enclosures: Cabinets, flush or surface mounted as indicted. NEMA Type 1 enclosure, except where the following enclosure requirements are indicated.
      1. NEMA 3R: Raintight.
   c. Front: Hinged front covers.
   d. Directory Frame: Metal, mounted inside each panel door.
   e. Bus: Hard drawn copper of 98 percent conductivity.
   f. Main and Neutral Lugs: Compression type.
   g. Equipment Ground Bus: Adequate for feeder and branch circuit equipment ground conductors. Bonded to box.

h. Service Equipment Approval: Listed for use as service equipment for panelboards having main service disconnect.

I. Provision for Future Devices: Equip with mounting brackets, bus connections, and necessary appurtenances, for the OCPD ampere ratings indicated for future installation of devices.

2. Lighting and Appliance Branch Circuit Panelboards

a. Branch OCPDs: Bolt on circuit breakers, replaceable without disturbing adjacent units.

c. Doors: In panel front, with concealed hinges. Secure with flush catch and tumbler lock, all keyed alike.

3. Identification

a. Panelboard Nameplates: Engraved laminated plastic or metal nameplate for each panelboard mounted with epoxy or industrial cement or industrial adhesive.

2.6 Overcurrent Protective Devices

1. Overcurrent Protective Devices (OCPD's), General

a. General: Provide OCPDs in indicated types, as integral components of panelboards and also as individually enclosed and mounted single units.

b. Enclosures: NEMA 250 "Enclosures for Electrical Equipment (1,000 Volts Maximum)."

2. Cartridge Fuses

a. General: NEMA Standard FU1, "Low Voltage Cartridge Fuses." Unless indicated otherwise, provide nonrenewable cartridge fuses of indicated types, classes, and current ratings that have voltage ratings consistent with the circuits on which used.

b. Class J Fuses: UL 198C, "High Interrupting Capacity Fuses, Current Limiting Type."

c. Class L Fuses: UL 198C, "High Interrupting Capacity Fuses, Current Limiting Type."

d. Class RK1 and RK5 Dual Element Time Delay Fuses: UL 198E, "Class R Fuses."

e. Class RK1 Fast Acting Fuses: UL 198E, "Class R Fuses."

3. Fusible Switches

a. General: UL 98 "Enclosed and Dead Front Switches" and NEMA KS 1 "Enclosed Switches," quick make, quick break heavy duty units.

b. Rating: Load breaking capacity in excess of the normal horsepower rating for the switch.

c. Withstand Capability: In excess of the let through current permitted by its fuse when subject to faults up to 100,000 RMS symmetrical amperes.

d. Operation: By means of external handle.

e. Interlock: Prevents access to switch interior except when in "off" position.
f. Fuse Clips: Rejection type.
g. Padlocking Provisions: For 2 padlocks, whether open or closed.
h. Enclosure for Independent Mounting: NEMA Type 1 enclosure except as otherwise indicated or required to suit environment where located.

4. Molded Case Circuit Breakers
   a. General: UL 489, "Molded Case Circuit Breakers and Circuit Breaker Enclosures," and NEMA AB 1, "Molded Case Circuit Breakers."
   b. Construction: Bolt in type, except breakers 225 ampere frame size and larger may be plug in type if held in place by positive locking device requiring mechanical release for removal.
   c. Construction: Bolt in type, except breakers in load center type panelboards and breakers 225 ampere frame size and larger may be plug in type if held in place by positive locking device requiring mechanical release for removal.
   d. Characteristics: Indicated frame size, trip rating, number of poles, and a short circuit interrupting capacity rating of 10,000 amperes symmetrical, unless a greater rating is indicated.
   e. Tripping Device: Quick make, quick break toggle mechanism with inverse time delay and instantaneous overcurrent trip protection for each pole.
   f. Enclosure for Panelboard Mounting: Suitable for panel mounting in switchboard or panelboards where indicated.
   g. Enclosure for Independent Mounting: NEMA Type 1 enclosure, except as otherwise indicated or required to suit environment where located.

2.7 Surge Protector

1. 120/240V, single phase, NEMA 12 surge panel with replaceable modules. UL 1449 3rd edition compliant. Leviton model ‘52120-M2’ or approved equal.
   a. Max surge current per mode – 100kA
   b. Max surge current per phase – 200kA

2.8 Electrical Service and Distribution

1. General: Provide service entrance equipment and accessories; of types, sizes, ratings and electrical characteristics indicated, which comply with manufacturer's standard materials, design and construction in accordance with published product information, and as required for complete installation; and as herein specified.
2. Circuit Breakers: Except as otherwise indicated, provide circuit breakers and ancillary components, of types, sizes, ratings, and electrical characteristics indicated, which comply with manufacturer's standard design, materials, components, and construction in accordance with published product information, and as required for a complete installation.

3. Meter Sockets:
   a. General: Provide meter sockets which comply with requirements of local utility company supplying electrical power to service entrance equipment of building project

2.9 BURIED CONDUIT: conduit may be Rigid PVC or Galvanized Steel

A. Rigid PVC Conduit PVC Conduit shall be schedule 40 piping and shall conform to the requirements of form 818, Section M.15.09.3.

B. Rigid Galvanized Steel conduit shall conform to the requirements of form 818, Section M.15.09.1.

2.10 Portland Cement Concrete for concrete shall conform to the requirements of form 816, Section M.03.01, Class "A".

2.11 Sand bedding for conduit duct banks shall conform to the requirements of form 816, Section M.05.01.3

2.12 Galvanizing for steel shall conform to the requirements of form 818, Section M.06.03.

2.13 Interior lighting shall be maximum 100-watt LED fixtures, ceiling mounted so the fixture is 12-ft above the finished floor. The lights shall be MaxLite High Bays Linear Series, or approved equal. Lights shall be furnished with motion sensors.

2.14 Automatic overhead door openers shall meet the requirements set forth in the "Section Doors" section of this specification.

PART 3 - EXECUTION

Installation of all electrical components and equipment shall be done by a Connecticut Licensed Electrician. All installations shall be in accordance with all applicable Codes, Manufacturer's requirements, and as directed by the Owner.

3.1 CONDUIT INSTALLATION

A. Conduit shall be laid and installed as indicated on the Contract plans or otherwise directed. All conduits when in place shall be true to the line and grade specified. Trenching and backfilling of conduit shall conform to the requirements of form 818, Article 10.01 and these specifications.

B. The conduit shall be bedded as detailed on the Contract Drawings and in accordance with these Contract specifications. All underground conduits shall be laid in a trench free of water. The Contractor shall furnish all equipment necessary to keep trenches free of water during the laying of pipe.

C. For buried conduit, marking tape shall be installed in the trench at the depth and to the requirements set forth in the Article 1.05.15 of Form 818

D. Schedule 40 PVC Conduit and Galvanized Steel Conduit shall be installed as detailed and directed in full accordance with the manufacturer's recommendations and accepted best practice, with the below listed qualifications and clarifications. The methods employed in performing the work and all equipment, tools and machinery used in handling material and executing any part of the work shall be started and, whenever found unsatisfactory, shall be changed and improved as required by the Owner. All equipment, tools and machinery used shall be maintained in a satisfactory working condition.

E. It shall be the responsibility of the contractor to ensure that Schedule 40 PVC be installed no less than 30" (thirty inches) below grade or steel piping must be used.

F. Proper implements, tools and facilities shall be provided and used by the Contractor for safe and convenient performance of the work. All conduit materials shall be lowered into the trench with a suitable device that will not damage the materials. Under no circumstance shall the materials be dropped or dumped into the trench. Any damaged materials shall be satisfactorily repaired or replaced.

G. Conduits shall be installed so that the bell end is at the transformer pad, switchgear vault, each manhole, each handhole or other structure. This includes existing and proposed structures.

H. Every precaution shall be taken to prevent foreign matter from entering the conduit while it is being placed in the trench. If the crew cannot put the conduit into the trench and in place without getting earth into it, the Owner may require that before lowering the conduit materials into the trench, a heavy tightly woven canvas bag of suitable size be placed over each end and left there until all connections are made. At times when work is not in progress, open ends shall be securely closed so that no trench water, earth or other substances will enter the conduit opening or fittings. If necessary, the line shall be flushed out to remove all foreign matter prior to pulling cable.

I. The cutting of conduit for installing fittings or closure pieces shall be done in a neat manner without damage to the conduit and so as to leave a smooth end at right angles to the axis of the conduit.

J. Joining of joints, fittings and accessories shall be provided in accordance with the recommendations of the manufacturer. The contractor shall provide at no additional expense to the Owner, all necessary adapters or terminators for use in pulling cables through the conduit.

K. Bends shall be used only at the locations shown on the plans or at other locations approved by the Utility Company.

L. A minimum 3/16" (three sixteenth inch) polypropylene pull string, or approved equal, shall be provided in each conduit within the duct banks.

M. Upon completion of the duct bank installation, all conduits shall have a conduit brush followed by a mandrel pulled through each conduit to ensure the conduits are free from obstructions and burrs.

a. Conduit brushes shall use round wire bristles. They shall have a pulling eye on one end, and a smaller twisted eye on the other end, which shall allow bi-directional pulling. Conduit brushes shall be sized as shown in the following table:

Conduit Size (in.)	Diameter (in.)	Working Load (pounds)
2.0	1.87	200
2.5	2.38	200
3.0	2.87	200
3.5	3.38	200
4.0	3.87	200
5.0	4.87	200
6.0	5.87	200

b. Conduit mandrels shall be flexible, and manufactured for cleaning out mud, dirt and light obstacles from the ducts before the installation of cable. Mandrels shall be suitable for pulling around tight bends, and use a tapered profile which allows for pulling in either direction. Pulling eyes shall be furnished on each end. The mandrel shall be fabricated from polyurethane, or an approved equal material, and shall not damage conduit inner walls. Conduit mandrels shall be sized as shown in the following table:

Conduit Size (in.)	Diameter (in.)	Working Load (pounds)
2.0	1.88	2,330
2.5	2.19	2,330
3.0	2.81	2,330
3.5	3.25	4,800
4.0	3.75	4,800
5.0	4.69	4,800
6.0	5.81	4,800

c. Conduit brushes and mandrels shall be manufactured for the purpose by a company regularly engaged in the production of electrical equipment. Mandrels shall not be fabricated by the Contractor in the shop or field.

3.2 CONDUCTOR INSTALLATION

A. Conductor installation and splicing shall conform to the applicable requirements of the National Electric Code, local electrical and other codes, laws, regulations and standards including those of all State authorities.
B. Provide wiring and grounding per lighting manufacturers recommendations and per applicable building code requirements.
C. Lubricant for pulling wires shall be inert to the cable and conduit and shall be special lubricant designed specifically for cable pulling and shall be chemically compatible with cable.
D. Provide the number of conductors required for a given circuit or as required for circuitry.

3.3 AUTOMATIC OVERHEAD DOOR OPENERS

A. Automatic overhead door openers shall be installed in accordance with the Manufacturers requirements.

END OF SECTION 33 70 00

IX. INSURANCE REQUIREMENTS

Project Insurance Requirements

1. Contractor/Vendor will agree to maintain in force at all times during which work/services are to be performed, the following minimum limits of insurance coverage. The insurance company(ies) must be licensed with the State of Connecticut and have a Financial Strength Rating of "A-" or higher and a Financial Size Rating of VIII or higher from A.M. Best Company. The limits of liability for insurance required by Paragraph 5.04 of the General Conditions shall provide coverage for not less than the following amounts or greater where required by Laws and Regulations.

2. CLA Engineers, Inc. and the Town of Montville shall be listed as additional insured as outlined in the following requirements.

3. If subcontractors are employed, same limits as named above shall apply and the certificate of insurance must be filed with the Owner.

4. Contractors shall observe and comply with all Federal, State and local laws, ordinances and regulations. Contractors shall indemnify and save harmless the Town, all of its officers, agents and servants against any claim or liability arising from or based on the violation of any such law, ordinance, regulation or negligence whether by the bidder, his employees, his consultant and/or their employees.

Insurance Requirements - Contractor Work Camp Oakdale Storage

Contractor shall agree to maintain in force at all times during the contract the following minimum coverages and shall name Town of Montville & Montville Board of Education as an Additional Insured on a primary and non-contributory basis to all policies, except Workers Compensation. All policies should also include a Waiver of Subrogation.

Insurance shall be written with Carriers approved in the State of Connecticut and with a minimum AM Best's Rating of "A-" VIII. In addition, all Carriers are subject to approval by Town of Montville & Montville Board of Education

		(Minimum Limits)
General Liability	Each Occurrence	$1,000,000
	General Aggregate	$2,000,000
	Products/Completed Operations Aggregate	$2,000,000
Auto (Any Auto Incl Hired/Non-Owned)	Combined Single Limit	$1,000,000
		$1,000,000
Excess Liability	Each Occurrence	$1,000,000
	Aggregate	

If any policy is written on a "Claims Made" basis, the policy must be continually renewed for a minimum of two (2) years from the completion date of this contract. If the policy is replaced and/or the retroactive date is changed, then the expiring policy must be endorsed to extend the reporting period for claims for the policy in effect during the contract for two (2) years from the completion date.

Workers' Compensation and	WC Statutory Limits	
Employers' Liability	EL Each Accident	$1,000,000
	EL Disease Each Employee	$1,000,000
	EL Disease Policy Limit	$1,000,000

Original, completed Certificates of Insurance must be presented to Town of Montville & Montville Board of Education prior to contract issuance. Contractor agrees to provide replacement/renewal certificates at least 60 days prior to the expiration date of the policies. Should any of the above-described policies be cancelled, limits reduced, or coverage altered, 60 days written notice must be given to Town of Montville & Montville Board of Education.

Insurance Requirements - Design Camp Oakdale Equipment Storage Garage

Contractor shall agree to maintain in force at all times during the contract the following minimum coverages and shall name Town of Montville & Montville Board of Education as an Additional Insured on a primary and non-contributory basis to all policies, except Workers Compensation. All policies should also include a Waiver of Subrogation.

Insurance shall be written with Carriers approved in the State of Connecticut and with a minimum AM Best's Rating of "A-" VIII. In addition, all Carriers are subject to approval by Town of Montville & Montville Board of Education

		(Minimum Limits)
General Liability	Each Occurrence	$1,000,000
	General Aggregate	$2,000,000
	Products/Completed Operations Aggregate	$2,000,000
Auto (Any Auto Incl Hired/Non-Owned)	Combined Single Limit	$1,000,000
		$1,000,000
Excess Liability	Each Occurrence	$1,000,000
	Aggregate	
		$1,000,000
Professional Liability	Each Claim	$1,000,000
	Aggregate	

If any policy is written on a "Claims Made" basis, the policy must be continually renewed for a minimum of two (2) years from the completion date of this contract. If the policy is replaced and/or the retroactive date is changed, then the expiring policy must be endorsed to extend the reporting period for claims for the policy in effect during the contract for two (2) years from the completion date.

Workers' Compensation and	WC Statutory Limits	
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