October 14, 2019

Specifications and Contract Documents

for

HOMETOWN HEROES PARK RESTROOMS

1001 East League City Parkway, League City, Texas

League City Project No. ITB 19-CIP-043
Issue for Bid & Permit

ZCA Project No. 1108801

October 14, 2019

Ziegler Cooper Architects, 700 Louisiana, Suite 350, Houston, Texas 77002

October 14, 2019

HOMETOWN HEROES PARK RESTROOMS
ISSUE FOR BID & PERMIT
ZIEGLER COOPER ARCHITECTS

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NOTICE TO BIDDERS

Sealed bids in duplicate, directed to City of League City, Texas, will be received until **__October 29, 2019, at the Office of the Purchasing Manager, 300 West Walker Street, League City, Texas 77573**, and then publicly opened and read aloud. Bids received after that time will not be accepted. The Bidder shall furnish all labor, materials, and equipment and perform all work for the construction of the following project:

Hometown Heroes Park Restrooms Project (PK 1905)
ITB #19-CIP-043

PROJECT SUMMARY

The plans, specifications, proposal form, and contract documents may be examined at the following locations:

City of League City
500 West Walker Street
League City, Texas 77573

Bid documents may be obtained from www.CivcastUSA.com, search League City, Galveston County. Bidders must register on this website in order to view and/or download specifications, plans, and bid documents for this project. There is NO charge to view or download documents.

A cashier's check or Certified Check from a Texas Bank, or acceptable Bid Bond from a reliable surety company authorized to do business in Texas, payable to the City of League City, in an amount not less than 5% of the maximum Bid price submitted, must accompany each Bid as a guarantee that, if awarded the contract, the bidder will, within 10 calendar days of Award of Contract, enter into a Contract and execute Bonds on the forms provided in the Contract Documents. The Bidder's deposit shall be forfeited and become the property of the OWNER in the event the Bidder neglects or refuses to enter into a contract and to furnish bonds acceptable to the OWNER within 10 calendar days after receipt of Notice to Award from the OWNER. The Bid Deposit of all except the three lowest Bidders will be returned within 10 calendar days after the opening of the bids. The Bid Deposit of the three lowest bidders will be returned within 7 working days after the executed contract and required Bonds have been fully approved by the OWNER.

The successful Bidder must furnish PERFORMANCE and PAYMENT BONDS on the forms furnished with the PROPOSAL, in the amount of 100% of the total contract price, from a surety company holding a permit from the State of Texas to act as surety. The surety company must have a minimum Best Key Rating of "B", or if the surety company does not have such a rating due to the length of time it has existed, the surety company must be eligible to participate in the surety bond guarantee program of the Small Business Administration and must be an approved surety listed in the current U.S. Department of Treasury Circular 570, and must meet all of the related rules and regulations of the Treasury Department. The surety company and the agency or agent issuing the PAYMENT and PERFORMANCE BONDS must be authorized to issue and sign PAYMENT and PERFORMANCE BONDS in Texas in an amount equal to, or greater than, the total Contract price.

An optional pre-bid conference will be held on ___October 21, 2019, at 2:00 p.m., at the City of League City, Public Works Department, 500 West Walker Street, League City, Texas 77573. All prospective Bidders are invited to attend. Failure to attend will not bar Bidders.

Upon consideration of the proposals the City Council plans to award a Contract; however, the City reserves the right to reject any and all bids, to waive any and all irregularities and technicalities, and to accept any bid which it deems advantageous to it. Each bidder agrees to waive any claim it has or may have against the Owner, the Engineer, and their respective employees, arising out of or in connection, with the administration, evaluation, or recommendation of any bid.

GENERAL INSTRUCTION TO BIDDERS

1. SCOPE OF WORK

The work to be done under the contract documents is included in the bid proposal.

Hometown Heroes Park Restrooms Project (PK 1905)
Bid No. 19-CIP-043

The Contractor shall furnish all labor, superintendence, machinery, equipment and all materials necessary to complete this project in accordance with the contract documents.

2. COMPLIANCE WITH CONTRACT DOCUMENTS

All work covered by this Contract shall be done in accordance with the contract documents as described in the General Conditions.

All bidders shall be thoroughly familiar with all of the requirements set forth in the contract documents for the construction of this project and shall be responsible for the satisfactory completion of all work contemplated by said contract documents.

3. PLANS FOR USE BY BIDDERS

It is the intent of the Owner that all parties interested in submitting a bid on the project covered by the contract documents be given a reasonable opportunity to examine the documents and prepare a bid.

4. INTERPRETATION OF TECHNICAL SPECIFICATIONS, PLANS AND OTHER DOCUMENTS

Bidders desiring additional information or clarification of technical specifications, plans or other documents must make written requests for such information to the Architect/Engineer as the Owner's representative prior to the deadline specified by the Architect/Engineer. Answers to all such requests will be given in writing, in addendum form, to all bidders, and all addenda will be bound with and become a part of the contract documents. Any addenda will be issued no later than three (3) calendar days prior to the deadline for submission of bids. No written or oral explanation or interpretation except that which is provided by the addenda prepared by the Architect/Engineer will be considered official or binding. If the bidder should find discrepancies in or omissions from the technical specifications or plans, or should some doubt exist as to their meaning, the bidder shall notify the Architect/Engineer in writing so that a written addendum may be sent to all bidders. It is the responsibility of the bidders to know if they have received all such addenda. A complete file on all addenda issued will be maintained at the Architect/Engineer’s office. In the event a bidder shall fail to seek clarification or interpretation of any part or portions of the technical specifications, plans or other documents, such bidder shall be presumed to have full knowledge of the interpretation by the Architect/Engineer.

5. CONDITIONS OF WORK

Each bidder shall fully inform himself of the construction and working conditions under which the work will be performed. Bidders shall inspect the site and thoroughly familiarize themselves with the full bid documents including technical specifications and plans. Failure to do so will not relieve a successful bidder of his obligation to perform the work in accordance with contractual requirements. It is understood that the bid prices shall include the furnishing of all superintendence, labor, material, machinery, equipment, tools, transportation, services and other means of construction, including parts, incidentals and appurtenances, as necessary to complete the work in accordance with the contract documents, technical specifications and plans.

Bidder should carefully examine the bidding documents and the site to determine the actual conditions under which work will be done. Data in the bidding documents pertaining to existing conditions is for convenience only and does not supplant obtaining firsthand information at the site. Submission of a bid constitutes acceptance by the bidder of existing site conditions as part of the requirements of this work.

6. SUBSURFACE INFORMATION

Any information provided in regard to subsurface data, test borings, etc., is to be considered approximate. Soil reports, if any, that the Architect/Engineer has obtained for this project will be provided to the bidders for their use. The interpretation of soil information, results of soil borings, etc., is in no way guaranteed.

7. OPEN SPECIFICATIONS

Where equipment or materials are specified by a trade or brand name, it is not the intention of the Owner to discriminate against an equal product of another manufacturer but rather to set a definite standard of quality and/or performance and to establish an equal basis for the evaluation of bids. Where the words "equivalent" or "equal to" are used, they shall be understood to mean that the thing referred to shall be, in the opinion or judgment of the Architect/Engineer, the equivalent of or equal to the product or item specified by name. Unless otherwise specified, all materials shall be the best of their respective kinds and shall be, in all cases, fully equivalent to approved samples. Notwithstanding that the words "equivalent", "equal to" or other such expressions may be used in the specifications in connection with a material, manufactured article or process, the material, article or process specifically designated shall be used unless a substitute shall be approved in writing by the Architect/Engineer. The Architect/Engineer has the right to require the use of such specifically designated materials, articles or processes.

8. PREVAILING WAGE RATES INFORMATION

Attention is called to the fact that the Contractor must pay labor on this project not less than the general prevailing rates of wages, which have been established for Galveston County and attached herein for reference.

As stated in the *Texas Government Code*, Title 10, Subtitle F, Chapter 2258, Subchapter B:

Sec. 2258.021. RIGHT TO BE PAID PREVAILING WAGE RATES.

(a) A worker employed on a public work by or on behalf of the state or a political subdivision of the state shall be paid:

(1) not less than the general prevailing rate of per diem wages for work of a similar character in the locality in which the work is performed; and

(2) not less than the general prevailing rate of per diem wages for legal holiday and overtime work.

(b) Subsection (a) does not apply to maintenance work.

(c) A worker is employed on a public work for the purposes of this section if the worker is employed by a contractor or subcontractor in the execution of a contract for the public work with the state, a political subdivision of the state, or any officer or public body of the state or a political subdivision of the state.

9. PREPARATION OF BID PROPOSAL

Unless otherwise directed in the Notice to Bidders, bids shall be submitted in duplicate upon forms furnished by the Owner or copies thereof. All bids shall be prepared in compliance with the requirements of the Notice to Bidders, these instructions and any instructions printed on the prescribed forms. All blank spaces in the form shall be correctly filled in, and the bidder shall state the price(s) in numerals, for which he proposes to do the work contemplated or to furnish the materials required. Such prices shall be written in ink, distinctly and legibly, or typewritten. Amounts shall be extended and totaled, and no change shall be made in the phraseology of the form or of the bid items thereon. If optional items are shown on the bid form and the bidder elects not to bid on such optional items, then "No Bid" must be entered in the blank spaces provided. If a space is left blank on the bid form, the Owner will interpret such blank as a "No Bid".

The bidder must sign the bid proposal in ink in the space provided on the bid form; unsigned bids will not be accepted. If the proposal is submitted by an individual, his name must be signed by him or his duly authorized agent. A bid submitted by a sole proprietorship must be signed by the proprietor and must clearly set out the name under which the proprietor is conducting business. If the proposal is submitted by a firm, association or partnership, then the name and address of the firm, association or partnership must be shown together with the name and address of each member, and the proposal must be signed by a member of the firm, association or partnership or other person duly authorized.

If the proposal is submitted by a company or corporation, the company or corporate name and business address, the name of the registered agent, the address of the registered office, and the names, addresses and offices of each corporate officer, must be given. Bids submitted by a corporation must be signed by an officer of the corporation having the

authority to execute such documents for the corporation, which authority is granted either by the corporate charter, the by-laws of the corporation or a resolution of the board of directors of the corporation, and shall specify under what authority the proposal is signed; the proposal shall be attested to by the secretary or an assistant secretary of the corporation, and the corporate seal shall be affixed thereto.

Powers of attorney authorizing agents or others to sign proposals must be properly certified and must be in writing and submitted with the proposal.

Each bid proposal shall be enclosed in a sealed envelope and submitted in duplicate, addressed as specified in the Notice to Bidders and bearing the bidder's name and the notation "Bid Enclosed - Proposal for *Hometown Heroes Park Restrooms Project (PK 1905)*"

10. BID BOND REQUIRED

Each bidder is required to submit a cashier's check issued by a bank satisfactory to the Owner, or a bid bond from a reliable surety company, payable without recourse to the order of the Owner, in an amount of not less than 5% of the total amount of the bid submitted as a guarantee that the bidder will enter into a contract and execute all necessary bonds (if required) within fifteen (15) days after notice of award of the contract to him.

11. FINANCIAL STATEMENT

Each bid must be accompanied by a financial statement of the bidder as reflected by his most recently prepared statement; the financial statement submitted must be current and shall not have been prepared prior to twelve (12) months immediately preceding the date specified for receipt of bids. The financial statement shall be submitted in a sealed envelope, properly identified as to contents and project description. The bidder's financial statement will be examined only if the bid submitted is actively considered for award; otherwise, it will be returned unopened after the execution of the Contract.

12. DELIVERY OF BIDS

It is the bidder's responsibility to deliver his bid in accordance with the instructions contained in the Notice to Bidders. Bids dispatched but not received by the date and time specified will be returned unopened upon receipt.

13. BID MODIFICATIONS

At any time prior to the deadline set for receipt of bids, a bid may be withdrawn and resubmitted by submitting a written request to do so to the person who holds the bid, but no proposal may be altered after the closing time set for receipt of bids. In addition, any bidder may modify his bid by telegraphic communication or by any available means of written or mechanically printed communication at any time prior to the scheduled closing time, provided such communication is received by the Owner at the City of League City's Purchasing Office prior to the deadline set for receipt of bids and provided further

that if written confirmation of the modification, over the actual signature of the bidder, has not been delivered into the hands of the Owner prior to the closing time, the Owner is satisfied that such written confirmation, over the actual signature of the bidder, was mailed prior to the closing time as determined from an examination of the postmark. If signed written confirmation is not received within two (2) days from the closing time, no consideration shall be given to such modification. Receipt of a bid modification by any other employee, office or division of the Owner shall not constitute receipt by the Owner, and it shall be the sole responsibility of the bidder to verify or confirm that any such modification has in fact been received by the City of League City's Purchasing Office prior to the deadline.

14. WITHDRAWAL OF BID

At any time prior to the time set for opening of the bids, a bid proposal may be withdrawn by submitting a written request to do so to the person who holds the bid.

15. REJECTION OF IRREGULAR OR IMPROPER BID

Any bid which contains any omission, alteration, erasure, addition or change of any nature, or which does not include prices for each and every bid item (excluding optional items) may, at the option of Owner, be deemed irregular. In order for any such bid to be considered, any alteration, erasure or other change must be initialed by the bidder prior to submission of the bid. In addition, any bid in which the prices are obviously unbalanced or which fails in any manner to conform to the bidding procedures as set forth may be considered irregular. Any bid proposal which is deemed irregular may be rejected and returned to the bidder without being considered.

Further, any proposal containing any conditions which provide for changes in the stated bid price due to increases or decreases in the cost of materials, labor or other items required for the project will be rejected and returned to the bidder without being considered.

16. OWNER'S RIGHT TO REQUIRE ADDITIONAL INFORMATION

The Owner reserves the right, after the bids have been opened and before the contract has been awarded, to conduct such investigations as the Owner deems necessary to assist in the evaluation of the bids and to establish the responsibility, qualifications and financial ability of bidders, proposed subcontractors, suppliers and other persons and organizations to perform the work in accordance with the Contract Documents; and to require of a bidder additional information to aid in the evaluation of the bid and the bidders qualifications including but not limited to the following information:

(a) The experience record of the bidder and key subcontractors, suppliers and other persons showing completed jobs of similar scope and work requirements to the one covered by the proposed Contract and all work in progress with bond amounts and percentage completed;
(b) A sworn statement of the current financial condition of the bidder, key subcontractors and suppliers;
(c) An equipment schedule.

17. AWARD OF CONTRACT

(a) Unless all bids are rejected, the Owner will award the Contract as promptly as possible, consistent with the time required for a thorough analysis of the bids submitted. However, the Owner reserves the right to delay award for ninety (90) days after receipt of bids. If no award is made within ninety (90) days after receipt of bids, a bidder may withdraw his bid without prejudice to himself by submitting a written request for its withdrawal to the person who holds the bid. The contract will be awarded to the bidder whose evaluation by Owner indicates to Owner that the award will be in the best interest of the project. The Contract will be awarded on the basis of all factors that are available to be judged by the Owner and deemed by the Owner to be of the greatest advantage to it, considering the type of work involved, the length of duration thereof, the elements of the bid, history and performance of bidders in previous jobs and other factors as shall be determined by the Owner. Each bidder agrees to waive any claim it has or may have against the Owner, the Architect/Engineer, and their respective employees, arising out of or in connection with the administration, evaluation, or recommendation of any bid. The Owner reserves the right to reject any or all bids and to waive bid irregularities as the interest of the Owner may require. Also, the Owner reserves the right to reject the bid of any bidder if the Owner believes that it would not be in the best interest of the Project to make an award to that bidder, whether because the bid is not responsive or the bidder is unqualified or of doubtful financial ability or fails to meet any other pertinent standard or criteria established by the Owner. Discrepancies in 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 sums.

The amount of experience on projects similar in type, size and complexity as this project which the bidders and key subcontractors have and the degree of success on such projects may affect the award.

It is the Owner's desire that the successful bidder and his key subcontractors be qualified and experienced in providing successful projects; that such successful bidder and key subcontractors have recent successful experience on several projects of similar size and nature as this project.

(b) The City may not execute the contract until it has received from the Bidder a completed, signed, TEC Form 1295 complete with a certificate number assigned by the Texas Ethics Commission ("TEC"), pursuant to Texas Government Code § 2252.908 and the rules promulgated thereunder by the TEC. The Bidder understands that failure to provide said form complete with a certificate number assigned by the TEC will prohibit the City from executing the final contract.

18. BOUND COPIES OF CONTRACT DOCUMENTS

The Agreement, Bonds and all related contract documents will be prepared and signed in not less than five (5) multiple original counterparts. Each set of contract documents shall be bound and shall include the following:

(a) Notice to Bidders;
(b) General Instructions to Bidders;
(c) Subcontractors and Major Suppliers Form;
(d) Bid Proposal;
(e) House Bill 89 Verification Document;
(f) Public Information Act Form;
(g) Performance, Payment and One Year Maintenance Bonds;
(h) Standard Form of Agreement;
(i) General Conditions of Agreements;
(j) Special Conditions;
(k) Technical Specifications (including plans and drawings),
(l) Insurance Certificates;
(m) All other documents made available to bidder for his inspection in accordance with the Notice to Bidders.

The Owner will furnish the Contractor with two (2) sets of conforming contract documents, technical specifications and plans free of charge. Plans and specifications for use during construction will only be furnished directly to the Contractor. The Contractor shall then distribute copies of plans and specifications to suppliers, subcontractors or others as required for proper prosecution of the work contemplated by the Contractor.

19. TEXAS STATE SALES TAX

This Contract is issued by an organization which qualifies for exemption provisions pursuant to provisions of Tex. Tax Code §§ 151.301, 151.307, 151.309 and 151.311.

The Contractor must obtain a limited sales, excise and use tax permit or exemption certificate which shall enable him to buy the materials to be incorporated into the work without paying the tax at the time of purchase.

20. INSURANCE

The Contractor shall not commence work under this Contract until he has obtained all insurance as required in the General Conditions of Agreement, set forth in the contract documents, from an underwriter authorized to do business in the State of Texas and satisfactory to the Owner. Proof of coverage shall be furnished to the Owner and written notice of cancellation or any material change shall be provided to the Owner not less than thirty (30) days in advance of cancellation or change. All policies shall contain an agreement on the part of the insurer waiving the right to subrogation.

The insurance certificates furnished shall name the Owner, the Architect/Engineer, their agents and employees, as an additional insured and shall further state that all subcontractors are named as additional insured or, in the alternative, shall be accompanied by a statement from the Contractor to the effect that no work on this particular project shall be subcontracted.

21. CONTRACTOR'S REPRESENTATIVE

The successful bidder shall be required to have a responsible local representative available at all times while the work is in progress under this Contract. The successful bidder shall be required to furnish the name, address and telephone number where such local representative may be reached during the time that the work contemplated by this Contract is in progress.

22. EVALUATION AND CONTRACT TIME

The City of League City intends to make an award using the evaluation criteria and other factors as indicated in this bid/proposal. The award shall be based on the lowest responsible, best-qualified and responsive bidder whose evaluation by the City of League City indicates to be in the best interest of the City and taxpayers.

Bid will be awarded based on “best value”. The award to the successful bidder will be determined by best value to the City of League City as allowed by Chapter 252 of the Local Government Code. The following criterial will be considered when selecting the successful bidder:

- the purchase price
- the schedule (calendar days to complete project)
- the reputation of the bidders and the bidder’s services;
- the quality of the bidder’s service;
- the extent to which the bidder’s services meet the City’s needs;
- the bidder’s past business relationship with the City:
- the impact on the ability of the City to comply with laws and rules relating to contracting with historically underutilized businesses and non-profit organizations employing person with disabilities;
- the total long-term cost to the City to acquire the bidder’s goods or services; and
- any relevant criteria specifically listed in the request for bids or proposals.

Commencement of Contract Time: The Contract Time begins to run on date indicated in the Notice to Proceed. Contractor is required to begin Work within ten (10) days of the date indicated on the Notice to Proceed.

23. The Contractor will determine the number of calendar days to achieve Substantial Completion of the Work and indicate this in the Bid Proposal, including application of topsoil and seed mix, after the date when the Contract Time began, and **30 calendar days** to achieve Completion and to meet all requirements for final payment. **In the determination of the contract time, Saturdays and Sundays will be counted, but work will not be permitted unless specifically approved by the City as stated in Item 25 below.**

    For projects with a requirement of CALENDAR DAYS TO COMPLETE PROJECT and/or TOTAL BID AMOUNT, the City will use the following schedule as the monetary value of a calendar day:

Amount of Contract ($)	**Value of a Calendar Day ($)**
Less than 25,000	100 per day
25,000 to 99,999.99	160 per day
100,000 to 999,999.99	240 per day
1,000,000 to 1,999,999.99	500 per day
2,000,000 to 2,999,999.99	1,000 per day
3,000,000 to 3,999,999.99	1,500 per day
More than 4,000,000.00	2,000 per day

    Bidders should be aware that the evaluation for the award may consider the number of days bid. The value of the day will be determined by the lowest days bid and the corresponding value of the contract. The difference in the number of days will be multiplied by the calendar day value and added to each bidder's base bid. This is also sometimes referred to as 'A+B' bidding.

    The CONTRACTOR will be permitted to prosecute the work in the order of his own choosing, unless stated otherwise in the Contract Documents, provided, however, the OWNER reserves the right to require the CONTRACTOR to submit a progress schedule of the work contemplated by the contract documents. In the event the OWNER requires a progress schedule to be submitted and it is determined by the OWNER that the progress of the work is not in accordance with such schedule, the OWNER may direct the CONTRACTOR to take such action as the OWNER deems necessary to insure completion of the project within the time specified.

24. LIQUIDATED DAMAGES

    Bidders should be aware that the City of League City expects timely completion of the contract within the timeframe indicated by the bidder in their bid. Consequently, bidders should be aware that the following schedule will be applied by the City as liquidated damages for each day the project is delayed in completion:

Amount of Contract ($)	**Value of a Calendar Day ($)**
Less than 25,000	100 per day
25,000 to 99,999.99	160 per day
100,000 to 999,999.99	240 per day
1,000,000 to 1,999,999.99	500 per day
2,000,000 to 2,999,999.99	1,000 per day
3,000,000 to 3,999,999.99	1,500 per day

More than 4,000,000.00	2,000 per day

Note: The sum of money thus deducted for such delay, failure, or non-completion is not to be considered as a penalty, but shall be deemed, taken and treated as reasonable liquidated damages, per day that the Contractor shall be in default after the time stipulated in the contract for completing the work.

25. WORKING HOURS

All construction work under this contract shall be performed between the hours of 7:00 a.m. and 7:00 p.m., Monday through Friday unless specific authorization is granted by the project representative after obtaining Owner's concurrence, or unless extension of working hours is necessary either to avoid lengthy interruption of utility service to the Owner's customers, or due to an emergency situation.

Construction work under this Contract requiring an on-site project representative will not be performed on weekends or holidays unless the following conditions exist:

(a) The project being constructed is essential to the Owner's ability to provide the necessary service to its citizens; or

(b) Delays in construction are due to factors outside the control of the Contractor. The Contractor is approaching the penalty provisions of the Contract and can show that he has made a diligent effort to complete the Contract within the allotted time.

Before construction work requiring an on-site project representative is to be performed on weekends or holidays, the Contractor must notify the Owner's representative not less than three (3) full working days prior to the weekend or holiday he desires to do work and obtain written permission from the Owner's representative to do such work. The final decision on whether to allow construction work requiring an on-site project representative on weekends or holidays will be made by the Owner's representative in coordination with the Owner. When such work is permitted, Contractor shall credit the Owner $50.00/hour by change order for site representation services for work on weekends or Legal Holidays.

The Contractor will not be permitted to work on any Holidays observed by the City. The Contractor may request a list of the official City holidays at the pre-construction conference.

Construction work requiring an on-site project representative will be any work where excavation, installation of pipes, materials, backfill or paving surface material installation is occurring and any work where investigation processes or testing processes are occurring or are required.

In any event, if a condition should occur or arise at the site of this project or from the work being done under this Contract which is hazardous or dangerous to property or life, the Contractor shall immediately commence work, regardless of the day of the week or the time

of day, to correct or alleviate such condition so that it is no longer dangerous to property or life.

26. MATERIALS AND WORKMANSHIP

The intent of these contract documents is that only materials and workmanship of the best quality and grade will be furnished. The fact that the specifications may fail to be sufficiently complete in some detail will not relieve the Contractor of full responsibility for providing materials of high quality and for protecting them adequately until completion of the project and acceptance by the Owner. The presence or absence of a representative of the Owner on the construction site will not relieve the Contractor of full responsibility for complying with this provision. The specifications for materials and methods set forth in the contract documents provide minimum standards of quality which the Owner believes necessary to procure a satisfactory project.

27. GUARANTEES

All equipment and materials incorporated in the project and all construction shall be guaranteed against defective materials and workmanship. Prior to final acceptance, the Contractor shall furnish the Owner with a written general guarantee which shall provide that the Contractor shall remedy any defects in the work, at no cost to the Owner, and pay for any and all damages of any nature whatsoever resulting from such defects when such defects appear as a result of defective materials or workmanship within one (1) year from the date of final acceptance of the work.

28. PROTECTION OF THE WORK

The Contractor shall be responsible for the care, preservation, conservation and protection of all materials, supplies, machinery, equipment, tools, apparatus, accessories, facilities and all means of construction, and any and all parts of the work, whether the Contractor has been paid, partially paid or not paid for such work until the date the Owner issues its certificate of completion to the Contractor.

29. PROTECTION OF SUBSURFACE LINES AND STRUCTURES

It shall be the Contractor's responsibility to prosecute the work contemplated by the contract documents in such a way as to exercise due care to locate and prevent damage to all underground pipelines, utility lines, conduits or other underground structures which might or could be damaged by Contractor during the construction of the project contemplated by these contract documents. The Owner will furnish Contractor with the approximate information of City owned utility lines of which it has knowledge. However, such fact shall not relieve the Contractor of his responsibilities aforementioned; the location and depth of utilities shown on any drawings must be regarded as approximate, and it shall be the responsibility of the Contractor to determine for himself the exact location and depth of any utilities which exist in the project site. All such underground lines or structures cut or damaged by Contractor during the prosecution of the work contemplated by this Contract shall be repaired immediately by Contractor, at Contractor's expense, to the

satisfaction of the Owner.

30. BARRICADES AND SAFETY MEASURES

The Contractor shall, at his own expense, furnish and erect such barricades, fences, lights and danger signals, and shall take such other precautionary measures for the protection of persons, property and the work as may be necessary.
The Contractor will be held responsible for all damage to the work due to failure of barricades, signs and lights to protect it; and when damage is incurred, the damaged portion shall be immediately removed and replaced by Contractor at his own cost and expense. The Contractor's responsibility for maintenance of barricades, signs and lights shall not cease until the date of issuance to Contractor of the Owner's certificate of acceptance of the project.

The Contractor will be held responsible for all damage to the work which may occur prior to final acceptance by the Owner regardless of the adequacy of protective barricades and lighting, and when damage is incurred, the damaged portion shall be immediately removed and replaced by Contractor at his own cost and expense.

31. EXPLOSIVES

The use of explosives will not be permitted.

32. PAYMENT OF EMPLOYEES

The Contractor and each of his subcontractors agree to pay all employees engaged in work on the project under this Contract in full (less mandatory legal deductions), and further agree that no such employees shall look to the Owner for payment of wages or compensation earned by reason of such work.

33. PAYMENT TO CONTRACTOR

All payments due to Contractor shall be made in accordance with the provisions of the General Conditions of Agreement of the contract documents.

34. AFFIDAVITS OF BILLS PAID

The Owner reserves the right, prior to final acceptance of this project or with the project's pay estimate submitted each month, to require the Contractor to execute an affidavit certifying that all bills for labor, materials and incidentals incurred in the construction of the improvements contemplated by the contract documents have been paid in full and that there are no claims pending of which the Contractor has been notified.

35. QUESTIONS

Submit questions about bidding documents before the deadline stated on the Civcast website. Inquiries will only be permitted and responded if submitted prior to the deadline

indicated. Necessary replies will be issued to bidders of record as addenda, which become a part of the bidding documents. Oral instructions do not form a part of the bidding documents.

36. LIST OF SUBCONTRACTORS AND MAJOR SUPPLIERS

With the bid, submit a list of subcontractors for major portions of the work and major suppliers. Give the names and addresses of the selected subcontractors and major suppliers listed in the bid proposal. Include on the list all "local" subcontractors and major suppliers. "Local" shall be defined as those subcontractors and major suppliers whose principal business location is in Galveston County. The "Subcontractors and Major Suppliers Form" is provided at the conclusion of the "General Instructions to Bidders" section, and shall be attached to Bid.

37. STATEMENT OF QUALIFICATIONS

Each bid must be accompanied by a statement of the qualifications of the Bidder to properly execute the work. No bid will be considered unless such a statement is submitted. Include in the statement of qualifications a list of ten (10) references minimum. The references shall consist of projects of similar nature, cost of the project, Owner's name, Architect/Engineer or prime contact and telephone number. The statement of qualifications shall also include the following:

- Organization available for the work contemplated on this project:
  - Available Manpower Description
  - Available Equipment Description
- Equipment Resources
  - Provide total list of firm's equipment

The amount of experience on projects similar in type, size and complexity as this project which the bidders and key subcontractors have and the degree of success on such projects may affect the award.

It is the Owner's desire that the successful bidder and his key subcontractors be qualified and experienced in providing successful projects; that such successful bidder and key subcontractors have recent successful experience on several projects of similar size and nature as this project.

38. SUPPLEMENTAL PAY ITEMS AND MINIMUM UNIT PRICE BID ITEMS

Approximate quantity and a minimum unit price have been established for certain supplemental items and for certain base bid items shown in the bid proposal section. The Contractor may not bid a unit price less than the minimum value; however, he may increase the minimum unit price. If no entry is made in the spaces provided, the minimum

unit prices shown shall apply. The supplemental pay items are included to facilitate payment for changes and alterations that may be required to complete work. The actual work as provided by the General and Special Conditions of the Agreement and Technical Specifications and as shown on Plans is described in Proposal items other than supplemental pay items. When work covered by supplemental items is requested by the Contractor and approved by Owner, payment will be based on the quantity actually constructed and unit prices bid in Proposal.

39. PRE-BID CONFERENCE

The pre-bid conference is not mandatory.

40. BID PACKAGE

All Bidders are required to submit the following with their bid:

a) Completed Bid Cover Sheet
b) Attachment A – Bid Sheet (Bid Proposal)
    a. Paper Copy (1 marked original, 2 marked copies)
    b. Electronic Copy (Vendor Name, Bid No. 19-CIP-043 ***Hometown Heroes Park Restrooms***)
c) Bidder Certification and Addenda Acknowledgment, Addendum(s) if applicable
d) Financial Statements, last 12 months
e) Statement of Qualifications, to include references (Attached shall be a list of 10 representative projects completed. Each project shall have an Owner's name and phone number)
f) Bid Bond (Security)
g) House Bill 89 Verification Document
h) Conflict of Interest Questionnaire
i) Public Information Act Form
j) List of Subcontractors and Major Suppliers Form

41. General Contractor must perform a minimum of 40 percent of the overall contract value.

42. DISCLOSURE OF INTERESTED PARTIES

Pursuant to Texas Government Code § 2252.908, the awarded bidder must submit a Disclosure of Interested Parties Form (Texas Ethics Commission Form 1295) to the City at the time of contract execution. Pursuant to the rules prescribed by the Texas Ethics Commission (TEC), Form 1295 must be completed online through the TEC's website (https://www.ethics.state.tx.us/tec/1295-Info.htm), where it will be assigned a certificate number. The awarded bidder must print, sign, and provide to the form to the City. For purposes of completing the TEC Form 1295, the governmental entity's name is **City of League City**; the contract ID number is **LC19 _ _ (this number will be inserted once the bid has been to Council)** , and the description of goods and services is ***Hometown Heroes Park Restrooms***: **Project (PK 1905)**. Neither the City nor its consultants have the ability to verify the information included in Form 1295, and neither have an obligation nor undertake responsibility for advising any bidder with respect to the proper completion of the TEC Form 1295.

SUBCONTRACTORS AND MAJOR SUPPLIERS FORM

LIST OF SUBCONTRACTORS AND TYPE OF WORK TO BE PERFORMED:

1. _____

2. _____

3. _____

4. _____

LIST OF LOCAL SUBCONTRACTORS:
(PRINCIPAL BUSINESS LOCATION IN GALVESTON COUNTY)

1. _____

2. _____

3. _____

4. _____

LIST OF MAJOR SUPPLIERS:

1. _____

2. _____

3. _____

4. _____

LIST OF LOCAL MAJOR SUPPLIERS:
(PRINCIPAL BUSINESS LOCATION IN GALVESTON COUNTY)

1. _____

2. _____

3. _____

4. _____

SECTION 003132 – GEOTECHNICAL DATA

PART 1 - GENERAL

1.1 GEOTECHNICAL REPORT

A. Geotechnical Investigation Reports have been prepared by Terracon Consultants, Inc. dated April 17, 2019, attached as Appendix A of this document.

1.2 AVAILABILITY OF GEOTECHNICAL DATA

A. A copy of the report is attached and shall be referenced to for a complete description of the conditions at the site.

1. This report was obtained only for the owner's use in foundation and parking area design and is not part of the Contract Documents. The report and log of borings is available for the Contractor's information, but is not a warranty of the subsurface conditions. The Contractor may use the report at his own risk.
2. Make no deviations from the recommendations of the geotechnical Investigation Report and the requirements of the Contract Documents without specific and written approval of the Owner and Architect.

1.3 USE OF GEOTECHNICAL DATA

A. The Contractor shall review the applicable portions of the Geotechnical Investigation Report and the technical sections of this project Manual. The Architect shall be notified of any discrepancies immediately. In the event of a conflict between the applicable portions of the Geotechnical investigation report and the technical sections, the stricter requirement shall govern.

B. The Contractor shall visit the site and acquaint himself with site conditions. Prior to bidding, the Contractor may make his own subsurface investigation to satisfy himself with site and subsurface conditions.

END OF SECTION 003132

Geotechnical Engineering Report

Hometown Heroes Park Restroom

SH 96 and Dickinson Avenue

League City, Texas

April 17, 2019

Terracon Project No. 91195009

Prepared for:

City of League City
League City, Texas

Prepared by:

Terracon Consultants, Inc.
League City, Texas

Terracon

April 17, 2019

City of League City
300 W Walker Street
League City, Texas 77573

Attn: Mr. Scott Tuma
Project Manager

Re: Geotechnical Engineering Report
Hometown Heroes Park Restroom
SH 96 and Dickinson Avenue
League City, Texas
Terracon Project No. 91195009

Dear Mr. Tuma:

Terracon Consultants, Inc. (Terracon) is pleased to submit our geotechnical engineering report for the project referenced above in League City, Texas. We trust that this report is responsive to your project needs. Please contact us if you have any questions or if we can be of further assistance.

We appreciate the opportunity to work with you on this project and look forward to providing additional geotechnical engineering and materials testing services in the future.

Sincerely,
Terracon Consultants, Inc.
(Texas Firm Registration No.: F-3272)

STATE OF TEXAS
BOBBIE S. HOOD
92951
LICENSED
PROFESSIONAL ENGINEER

Rehan Khan, E.I.T.
Staff Geotechnical Engineer

Bobbie S. Hood, P.E.
Geotechnical Services Manager

Copies To: Addressee: (1) Electronic

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EXECUTIVE SUMMARY

This geotechnical engineering report has been prepared for the proposed construction of a restroom building inside Hometown Heroes Park in League City, Texas. The subsurface conditions were evaluated by drilling one boring, designated B-1, to a depth of about 20 feet within the proposed building footprint.

Based on the information obtained from our subsurface exploration, the site can be developed for the proposed project. A summary of our findings and recommendations is provided below:

- Groundwater was not observed at boring B-1 during or on completion of dry drilling.

- Fill soils were observed at the ground surface at boring B-1 and extended to a depth of about 2 feet. Support of the floor slab and flatworks on or above existing fill soils is discussed in this report. However, even with the recommended construction testing services, an inherent risk exists for the owner that compressible fill or unsuitable material within or buried by the fill will not be discovered.

- Expansive soils were observed at this site. The potential vertical rise (PVR) of the existing soil at this site was estimated to be about 3¼ inches in its present condition. Recommendations are provided in this report to help reduce the effects of soil shrinkage and expansion. However, even if these procedures are followed, some movement and distress in the building should be anticipated.

- A conventionally-reinforced, monolithically-poured slab-on-grade should be utilized for support of the proposed building.

- A minimum 48-inch thick select fill pad should be placed under the proposed building to provide uniform support to the slab and reduce the estimated Potential Vertical Rise (PVR) of the subgrade to approximately one inch or less. The select fill should extend a minimum of 5 feet beyond the edge of the building.

This executive summary should be used in conjunction with the entire report for design purposes. Details were not included or fully developed in this section, and the report must be read in its entirety for a comprehensive understanding of the items contained herein. The section titled **"5.0 GENERAL COMMENTS"** should be read for an understanding of the report limitations.

GEOTECHNICAL ENGINEERING REPORT
HOMETOWN HEROES PARK RESTROOM
SH 96 AND DICKINSON AVENUE
LEAGUE CITY, TEXAS

Project No. 91195009
April 17, 2019

1.0 INTRODUCTION

Terracon Consultants, Inc. (Terracon) is pleased to submit our geotechnical engineering report for the proposed construction of a restroom building inside Hometown Heroes Park in League City, Texas. This project was authorized by Ms. Angie Steelman, Purchasing Manager with City of League City, by issuing Purchase Order (Contract # 3190303). The project scope was performed in general accordance with Terracon Proposal No. P91195009, dated January 24, 2019.

The purpose of this geotechnical engineering report is to describe the subsurface conditions observed at the boring drilled for this project, analyze and evaluate the test data, and provide recommendations with respect to:

- Site and subgrade preparation; and
- Foundation design and construction.

2.0 PROJECT INFORMATION

2.1 Project Description

Item	Description
Project location	The project site is located at the southeast corner of the intersection of SH 96 and Dickinson Avenue in League City, Texas. See Appendix A, Exhibit A-1, Site Location Plan.
Site layout	See Appendix A, Exhibit A-2, Boring Location Plan.
Proposed structure	A single-story restroom building with a footprint area of 450 square feet.
Finished floor elevation of the building (assumed)	Within approximately one to two feet above existing grade.
Building construction (assumed)	CMU block.

Item	Description
Maximum loads (assumed)	■ **Columns loads:** 100 kips. ■ **Floor slab pressure:** 125 pounds per square foot (psf).
Planned foundation system (assumed)	Conventionally-reinforced, monolithically-poured slab-on-grade.

2.2 Site Description

Item	Description
Existing conditions	The site was vacant at the time of our field program. Sports fields and parking lots were observed in the vicinity of the site.
Existing topography	Relatively level.

3.0 SUBSURFACE CONDITIONS

3.1 Geology

Based on the geologic maps published by the Bureau of Economic Geology, the site for the proposed construction is located on the Beaumont formation, a deltaic nonmarine Pleistocene deposit. The Beaumont formation is heterogeneous containing thick interbedded layers of clay, fine sand, and silt.

The coastal plain in this region has a complex tectonic geology, several major features of which are: Gulf Coastal geosyncline, salt domes, and major sea level fluctuations during the glacial stages, subsidence and geologic faulting activities. Most of these geologic faulting activities have ceased for millions of years, but some are still active. A detailed geologic fault investigation and study of the site geology are beyond the scope of this report.

3.2 Typical Profile

The particular subsurface stratigraphy, as evaluated from our field and laboratory programs, is shown in detail on the Boring Logs in Appendix A. Stratification boundaries on the Boring Logs represent the approximate location of changes in soil types; in-situ, the transition between materials may be gradual.

Fill soils were observed at the ground surface at boring B-1 and extended to a depth of about 2 feet. The subsurface soils generally consisted of fat clay and lean clay soils to the termination depth of the boring (approximately 20 feet).

The results of our field and laboratory programs can be summarized as follows:

Subsurface Soils				
Description	**Plasticity Index**	**Moisture Content (%)**	**Moisture Content vs. Plastic Limit[1]**	**Undrained Shear Strength (psf)**
Fill: Lean Clay	31	16	+5	2.0 [3]
Fat Clay	39 to 51	23 to 25	+9 to +11	1,000 [2]
Lean Clay	---	---	---	2.5 to 2.75 [3]

1. The difference between a soil sample's moisture content and its corresponding plastic limit.
2. Based on unconfined compressive strength test.
3. Hand penetrometer readings in tons per square foot (tsf).

3.3 Groundwater

Boring B-1 was advanced using dry augering techniques to its termination depth (about 20 feet) in an effort to evaluate groundwater conditions at the time of our field program. Groundwater was not observed at boring B-1 during or upon completion of dry drilling.

These groundwater observations are considered approximate and short-term, since the boring was open for a short time period. On a long-term basis, groundwater may be present within the depths explored. In addition, groundwater will fluctuate seasonally with climatic changes and should be evaluated at the time of construction.

4.0 RECOMMENDATIONS FOR DESIGN AND CONSTRUCTION

The following recommendations are based upon the data obtained in our field and laboratory programs, project information provided to us, and on our experience with similar subsurface and site conditions.

4.1 Geotechnical Considerations

Fill soils were observed at the ground surface at boring B-1 and extended to a depth of about 2 feet. Support of the floor slab and flatworks on or above existing fill soils is discussed in this report. However, even with the recommended construction testing services, an inherent risk exists for the owner that compressible fill or unsuitable material within or buried by the fill will not be discovered. This risk of unforeseen conditions cannot be eliminated without completely removing the existing fill.

Expansive soils were observed at this site. This report provides recommendations to help reduce the effects of soil shrinkage and expansion. However, even if these procedures are followed, some movement and distress in the building should be anticipated. The severity of

distress will increase if any modifications of the site result in excessive wetting or drying of the expansive soils. Eliminating the risk of movement associated with expansive soils may not be feasible. However, the risk can be significantly reduced if the slab is designed as a structural slab with a void space with structural loads supported by a foundation system extending below the active zone. Terracon can provide recommendations for a structural slab system, if requested.

4.2 Earthwork

The proposed building footprint area should be stripped of vegetation, topsoil, and other debris/unsuitable material. Proper site drainage should be maintained during construction so that ponding of surface runoff does not occur and cause construction delays and/or inhibit site access.

Once initial site stripping is completed and final subgrade elevations have been achieved, the exposed soil subgrade area should be carefully proofrolled with a 20-ton pneumatic roller or equivalent equipment, such as a fully loaded dump truck, to detect weak zones in the subgrade. Special care should be exercised when proofrolling areas containing fill soils to detect soft/weak areas within the fill soils. Weak areas detected during proofrolling, as well as zones of fill containing organic matter and/or debris, should be removed and replaced with soils exhibiting similar classification, moisture content, and density as the adjacent in-situ soils. Proofrolling should be performed under the direct observation of the geotechnical engineer or his/her representative.

Subsequent to proofrolling and just prior to placement of fill, the exposed subgrade within the construction areas should be evaluated for moisture and density. If the moisture and/or density do not meet the criteria described in the **"4.2.1 Compaction Requirements"** section for on-site soils, the subgrade should be scarified to a minimum depth of 6 inches, moisture adjusted, and compacted to at least 95 percent of the Standard Effort (ASTM D698) maximum dry density.

Select fill to be used at this site for grade adjustments should meet the following criteria.

Fill Type	Specifications	Acceptable Location for Placement
Select fill	CL[1] and/or SC[1] (10≤PI≤20)	Must be used to construct the pad under the building floor slab and for all grade adjustments within the building area.

[1] USCS Classification.

If blended or mixed soils are intended for use to construct the building pad, Terracon should be contacted to provide additional recommendations. Blended or mixed soils do not occur naturally. These soils are a blend of sand and clay and will require mechanical mixing with a pulvimixer at the site. If these soils are not mixed thoroughly to break down the clay clods and blend-in the sand to produce a uniform soil matrix, the fill material may be detrimental to the slab

performance. If blended soils are used, we recommend that additional samples of the blended soils, as well as the clay clods, be obtained prior to and during earthwork operations to evaluate if the blended soils can be used in lieu of select fill. The actual type and amount of mechanical mixing at the site will depend on the amount of clay and sand, and properties of the clay.

4.2.1 Compaction Requirements

Item	Description
Fill lift thickness	The fill soils should be placed on prepared surfaces in lifts not to exceed 8 inches loose measure, with compacted thickness not to exceed 6 inches.
Compaction requirements	■ The select fill soils should be compacted to at least 95 percent of the Standard Effort (ASTM D698) maximum dry density at a moisture content within 2 percent of the optimum moisture content. ■ The on-site clay soils should be compacted to at least 95 percent of the Standard Effort (ASTM D698) maximum dry density at a moisture content between optimum and 4 percent wet of the optimum moisture content.

Prior to any filling operations, samples of the proposed borrow and on-site materials should be obtained for laboratory moisture-density testing. The tests will provide a basis for evaluation of fill compaction by in-place density testing. A qualified soil technician should perform sufficient in-place density tests during the filling operations to evaluate that proper levels of compaction, including dry unit weight and moisture content, are being attained.

4.2.2 Wet Weather / Soft Subgrade Considerations

Construction operations may encounter difficulties due to wet or soft surface soils becoming a general hindrance to equipment due to rutting and pumping of the soil surface, especially during and soon after periods of wet weather. If the subgrade cannot be adequately compacted to the minimum densities as described previously, one of the following measures will be required: 1) removal and replacement with select fill, 2) chemical treatment of the soil to dry and improve the condition of the subgrade, or 3) drying by natural means if the schedule allows. In our experience with similar soils in this area, chemical treatment is an efficient and effective method to improve the condition of wet and weak subgrade. Terracon should be contacted for additional recommendations if chemical treatment of the soils is needed.

4.2.3 Grading and Drainage

All grades must provide effective drainage away from the proposed building during and after construction. Water permitted to pond next to the building can result in distress in the building. These greater movements can result in unacceptable differential slab movements and cracked slab and walls, and roof leaks. Slab and foundation performances described in this report are

based on effective drainage for the life of the building and cannot be relied upon if effective drainage is not maintained.

Exposed ground should be sloped away from the building for at least 10 feet beyond the perimeter of the building. After construction and landscaping, we recommend verifying final grades to document that effective drainage has been achieved. Grades around the building should also be periodically inspected and adjusted as necessary, as part of the building's maintenance program.

Planters located within 10 feet of the building should be self-contained to prevent water accessing the building and pavement subgrade soils. Locate sprinkler mains and spray heads a minimum of 5 feet away from the building lines. Low-volume, drip-style landscaped irrigation should not be used near the building. Collect roof runoff in drains or gutters. Discharge roof drains and downspouts onto flatworks which slope away from the building or extend down spouts a minimum of 10 feet away from building.

Flatworks will be subject to post-construction movement. Maximum grades practical should be used for flatwork to prevent water from ponding. Allowances in final grades should also consider post-construction movement of flatwork, particularly if such movement would be critical. Where paving or flatwork abuts the building, effectively seal and maintain joints to prevent surface water infiltration.

Utility trenches are a common source of water infiltration and migration. All utility trenches that penetrate beneath the building should be effectively sealed to restrict water intrusion and flow through the trenches that could migrate below the building. We recommend constructing an effective clay "trench plug" that extends at least 5 feet out from the face of the building's exterior. The plug material should consist of clay compacted at a water content at or above the soils optimum water content. The clay fill should be placed to completely surround the utility line and be compacted in accordance with recommendations in this report.

4.3 Foundation System

Based on the subsurface conditions observed during our field and laboratory programs, a foundation system consisting of a conventionally-reinforced, monolithically-poured slab-on-grade should be utilized to support the proposed building, provided the subgrade is properly prepared as described in this report.

Recommendations for this foundation system are provided in the following sections, along with other geotechnical considerations for this project.

4.3.1 Design Recommendations – Slab-on-Grade

The near surface soils at this site generally exhibited a high expansion potential. These soils can subject the proposed building to significant movements (due to shrinking and swelling) with fluctuations in their moisture content. This movement potential is influenced primarily by the properties of the subgrade soils, as well as the moisture content of the subgrade at the time of construction, overburden pressures, and the stability of the moisture contents throughout the life of the building. Based on the information developed from our field and laboratory programs and on method TEX-124-E in the Texas Department of Transportation (TxDOT) Manual of Testing Procedures, we estimate that the subgrade soils at this site exhibit a Potential Vertical Rise (PVR) of up to approximately 3¼ inches. Therefore, we highly recommend that the near-surface soils be prepared as stated below to reduce the potential for slab movement associated with volumetric changes of the near-surface clay soils due to moisture variations to a more acceptable level. The actual movements could be greater if poor drainage, ponded water, and/or other sources of moisture are allowed to infiltrate beneath the building after construction.

The most common method of subgrade preparation to reduce potential expansion of the subgrade would be to provide a pad of properly placed and compacted select fill beneath the proposed building. The corresponding decrease in the potential soil movements is primarily a function of the fill pad thickness and the moisture levels of the underlying clay subgrade. While the indicated preparations do not eliminate the potential for soil movement, the magnitude of such movements should be reduced to more acceptable levels. To provide uniform support beneath the building and reduce the estimated PVR to approximately one inch or less, we recommend that a minimum 48-inch thick pad of properly placed and compacted select fill material be constructed immediately beneath the slabs. We recommend that the select fill pad extend a minimum of 5 feet beyond the edges of the structures.

Select fill should be used for all grade adjustments in the building area. Based on the above recommendations, the slab-on-grade foundation may bear within the properly compacted select fill soils, provided that the structure's select fill pad and subgrade soils are prepared as outlined in the **"4.2 Earthwork"** section of this report, which contains material and placement requirements for select fill, as well as other subgrade preparation recommendations.

The slab-on-grade foundation may be designed using the following parameters provided that the structure's subgrade is prepared as discussed above:

Description	Design Parameters
Select fill building pad	Minimum thickness of 48 inches
Estimated PVR[1]	Approximately one inch or less
Climatic rating	25

Description	Design Parameters
Design Plasticity Index[1]	30
Soil support index	0.88
Minimum perimeter grade beam embedment depth	18 inches below final exterior grade
Allowable bearing capacity	Dead Load Plus Sustained Live Load: 1,200 psf Total Net Load: 1,800 psf

1. Based on 48-inch thick select fill pad.

The parameters indicated for the above design conditions are based on criteria published by the Building Research Advisory Board (B.R.A.B.). The B.R.A.B. method is essentially an empirical design technique and the parameters provided are based on our interpretation of the project soil borings and criteria published in the B.R.A.B. design manual.

The slab-on-grade foundation system should be designed to tolerate the anticipated soil movement and provide satisfactory support to the proposed skid structures and cooler. The foundation should have adequate exterior and interior grade beams to provide sufficient rigidity to the foundation system such that the slab deflections that result are considered tolerable to the supported structure. The minimum perimeter grade beam depth recommendation provided above is to reduce surface water migration below the foundation elements and to develop proper end bearing and is not based on structural considerations.

Post construction settlements for the described slab-on-grade foundation system should be one inch or less, provided that the subgrade soils are prepared as outlined herein and that the select fill is properly placed and compacted in accordance with the recommendations contained in this report. Settlement response of the slab-on-grade foundation system is expected to be influenced more by the quality of construction and fill placement than by soil-structure interaction.

4.3.2 Construction Considerations – Slab-on-Grade

Excavations for shallow foundations should be performed with equipment capable of providing a relatively clean bearing area. The bottom 6 inches of the foundation excavations should be completed with a smooth-mouthed bucket or by hand labor. The excavations should be neatly excavated and properly formed. Debris in the bottom of the excavation should be removed prior to steel placement. Water should not be allowed to accumulate at the bottom of the foundation excavations. To reduce the potential for groundwater seepage into the excavations and to minimize disturbance to the bearing area, we recommend that steel and concrete be placed as soon as possible after the excavations are completed and properly cleaned. The bearing

surface of the foundations should be evaluated after excavation is completed and immediately prior to placing concrete. Excavations should not be left open overnight.

If the foundation excavations are planned to be open overnight, we recommend that a thin seal slab (about 2 to 4 inches thick) of lean concrete be placed over the excavation bottom to protect the bearing surface from disturbance.

4.3.3 Foundation Construction Monitoring

The performance of the foundation systems for the proposed structures will be highly dependent upon the quality of construction. Thus, we recommend that the subgrade preparation, fill compaction, and foundation installation be monitored full-time by an experienced Terracon soil technician under the direction of our geotechnical engineer. During foundation installation, the base of foundations should be monitored to evaluate the subgrade. We would be pleased to develop a plan for compaction and foundation installation monitoring to be incorporated in the overall quality control program.

5.0 GENERAL COMMENTS

Terracon should be retained to review the final design plans and specifications so comments can be made regarding interpretation and implementation of our geotechnical recommendations in the design and specifications. Terracon also should be retained to provide observation and testing services during grading, excavation, foundation installation, and other earth-related construction phases of the project.

The analysis and recommendations presented in this report are based upon the data obtained from the boring performed at the indicated location and from other information discussed in this report. This report does not reflect variations that may occur across the site or due to the modifying effects of weather. The nature and extent of such variations may not become evident until during or after construction. If variations appear, we should be immediately notified so that further evaluation and supplemental recommendations can be provided.

The scope of services for this project does not include either specifically or by implication any environmental or biological (e.g., mold, fungi, and bacteria) assessment of the site or identification or prevention of pollutants, hazardous materials or conditions. If the owner is concerned about the potential for such contamination or pollution, other services should be undertaken.

For any excavation construction activities at this site, all Occupational Safety and Health Administration (OSHA) guidelines and directives should be followed by the Contractor during construction to insure a safe working environment. In regards to worker safety, OSHA Safety

and Health Standards require the protection of workers from excavation instability in trench situations.

This report has been prepared for the exclusive use of our client for specific application to the project discussed and has been prepared in accordance with generally accepted geotechnical engineering practices. No warranties, either express or implied, are intended or made. Site safety, excavation support, and dewatering requirements are the responsibility of others. In the event that changes in the nature, design, or location of the project as outlined in this report are planned, the conclusions and recommendations contained in this report shall not be considered valid unless Terracon reviews the changes and either verifies or modifies the conclusions of this report in writing.

APPENDIX A

FIELD EXPLORATION

AERIAL PHOTOGRAPHY PROVIDED BY MICROSOFT BING MAPS

DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

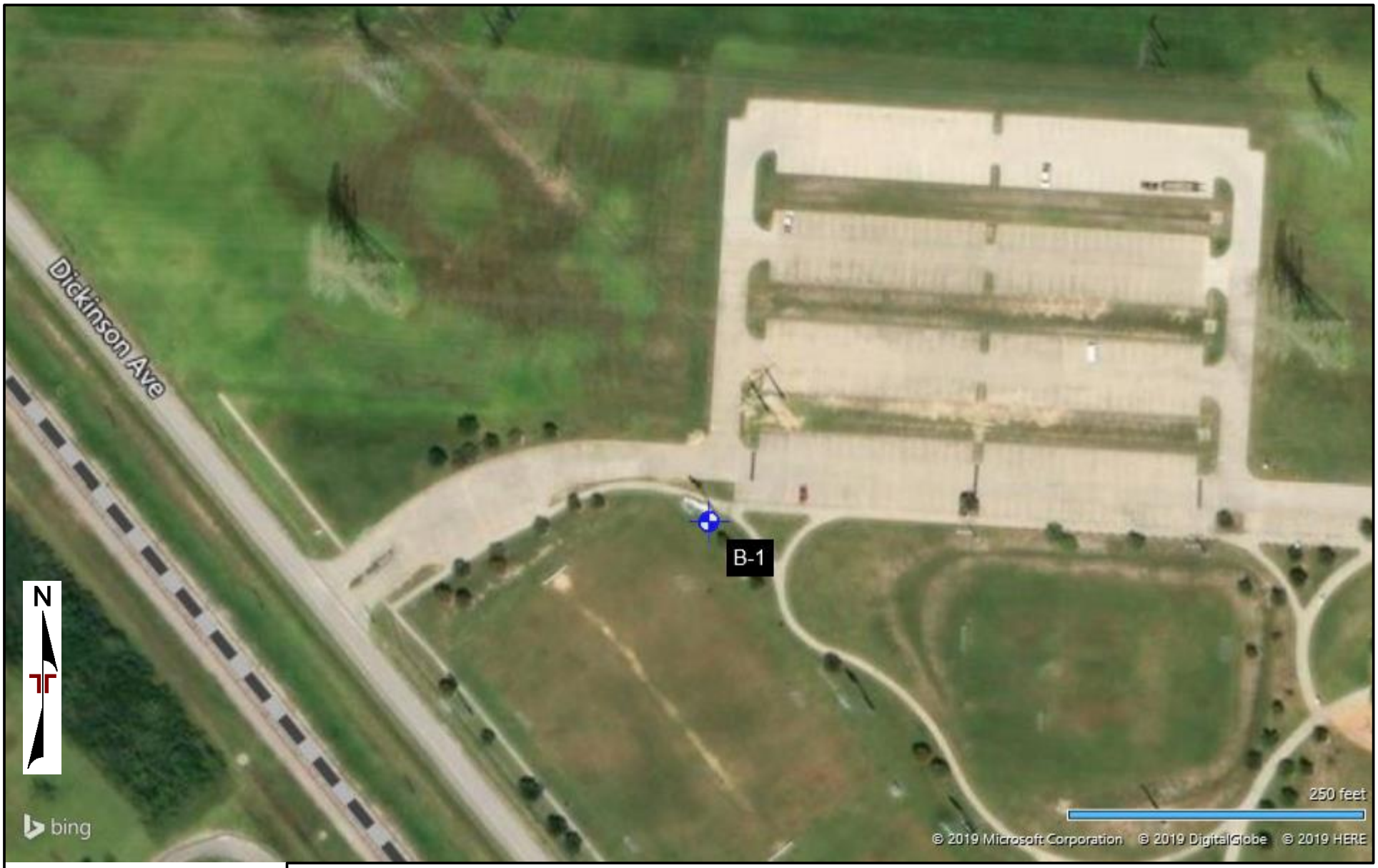
Project Manager: RK	Project No. 91195009
Drawn by: RK	Scale: AS SHOWN
Checked by: BSH	File Name: CAD
Approved by: BSH	Date: 4/12/19

Terracon
551 W League City Pkwy, Ste F
League City, TX 77573-5463

SITE LOCATION

Hometown Heroes Park Restroom
SH 96 and Dickinson Avenue
League City, Texas

Exhibit
A-1



AERIAL PHOTOGRAPHY PROVIDED BY MICROSOFT BING MAPS

DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

Project Manager:	RK
Drawn by:	RK
Checked by:	BSH
Approved by:	BSH

Project No.	91195009
Scale:	AS SHOWN
File Name:	CAD
Date:	4/12/19

Terracon
551 W League City Pkwy, Ste F
League City, TX 77573-5463

BORING LOCATION PLAN

Hometown Heroes Park Restroom
SH 96 and Dickinson Avenue
League City, Texas

Exhibit
A-2

Field Exploration Description

The subsurface conditions were evaluated by drilling one boring, designated B-1, to a depth of about 20 feet within the proposed building footprint. The boring was drilled using truck-mounted drilling equipment at the approximate location shown on the Boring Location Plan, Exhibit A-2 of Appendix A. The boring was located in the field using a hand-held Global Positioning System (GPS) unit with an accuracy of approximately ±25 feet and is shown on the Boring Log. Boring depth was measured from existing grade at the time of our field program. Upon completion of our field program, the boring was backfilled with soil cuttings.

The Boring Log, presenting the subsurface soil descriptions, type of sampling used, and additional field data, are presented on Exhibit A-4 of Appendix A. The General Notes, which defines the terms used on the logs, are presented on Exhibit C-1. The Unified Soil Classification System is presented on Exhibit C-2 of Appendix C.

Soil samples were generally recovered using open-tube samplers. Pocket penetrometer tests were performed on samples of cohesive soils in the field to serve as a general measure of consistency.

Samples were removed from samplers in the field, visually classified, and appropriately sealed in sample containers to preserve their in-situ moisture contents. Samples were then transported to our laboratory in League City, Texas.

BORING LOG NO. B-1

PROJECT: Hometown Heroes Park Restroom

CLIENT: City of League City
League City, Texas

SITE: League City Pkwy and Dickinson Avenue
League City, Texas

LOCATION See Exhibit A-2

Latitude: 29.49212° Longitude: -95.07355°

GRAPHIC LOG	DEPTH		DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	STRENGTH TEST: TEST TYPE	STRENGTH TEST: COMPRESSIVE STRENGTH (tsf)	STRENGTH TEST: STRAIN (%)	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS: LL-PL-PI	PERCENT FINES
		FILL - LEAN CLAY (CL), dark gray				2.0 (HP)				16		42-11-31	
	2.0	**FAT CLAY (CH)**, gray, stiff				1.25 (HP)		1.01	15	23	108	65-14-51	
		-tan and light gray with ferrous nodules 4 to 8 feet	5			1.25 (HP)							
		-with calcareous nodules 6 to 8 feet				1.75 (HP)				25		53-14-39	
	8.0	**LEAN CLAY (CL)**, tan and light gray, very stiff, with ferrous nodules				2.5 (HP)							
			10			2.75 (HP)							
	12.0	**FAT CLAY (CH)**, reddish brown and light gray, very stiff											
						2.75 (HP)							
		-tan and light gray with ferrous nodules below 15 feet	15										
	20.0					4.0 (HP)							
		Boring Terminated at 20 Feet	20										

Stratification lines are approximate. In-situ, the transition may be gradual.

Advancement Method:
Dry augered to 20 feet.

Abandonment Method:
Boring backfilled with auger cuttings upon completion.

See Exhibit A-3 for description of field procedures.
See Appendix B for description of laboratory procedures and additional data (if any).
See Appendix C for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

No free water observed

Terracon
551 W League City Pkwy, Ste F
League City, TX

Boring Started: 02-28-2019 | Boring Completed: 02-28-2019
Drill Rig: Truck | Driller: Herman Drilling
Project No.: 91195009 | Exhibit: A-4

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL 91195009 HOMETOWN HEROES P.GPJ MODELLAYER.GPJ 4/12/19

APPENDIX B

LABORATORY TESTING

Laboratory Testing

Soil samples were tested in the laboratory to measure their dry unit weight (ASTM D7263) and natural water content (ASTM D2216). Unconfined compressive strength test (ASTM D2166) was performed on one sample and a calibrated hand penetrometer was used to estimate the approximate unconfined compressive strength of some samples. The calibrated hand penetrometer values have been correlated with unconfined compression tests and provide a better estimate of soil consistency than visual examination alone. Selected samples were also classified using the results of Atterberg limits (ASTM D4318). The test results are provided on the Boring Logs included in Appendix A and in **"3.2 Typical Profile"** section of this report.

ASTM procedural standards noted above are for reference methodology in general. In some cases, variations to methods are applied as a result of local practice or professional judgment.

Descriptive classifications of the soils indicated on the Boring Log are in general accordance with the enclosed General Notes and the Unified Soil Classification System. Also shown are estimated Unified Soil Classification Symbols. A brief description of this classification system is attached to this report. Classification of the soil samples was generally determined by visual manual procedures.

Samples not tested in the laboratory will be stored for a period of 30 days subsequent to submittal of this report and will be discarded after this period, unless we are notified otherwise.

APPENDIX C

SUPPORTING DOCUMENTS

GENERAL NOTES

DESCRIPTION OF SYMBOLS AND ABBREVIATIONS

SAMPLING

Shelby Tube

WATER LEVEL

Water Initially Encountered

Water Level After a Specified Period of Time

Water Level After a Specified Period of Time

Water levels indicated on the soil boring logs are the levels measured in the borehole at the times indicated. Groundwater level variations will occur over time. In low permeability soils, accurate determination of groundwater levels is not possible with short term water level observations.

FIELD TESTS

N	**Standard Penetration Test Resistance (Blows/Ft.)**
(HP)	**Hand Penetrometer**
(T)	**Torvane**
(DCP)	**Dynamic Cone Penetrometer**
(PID)	**Photo-Ionization Detector**
(OVA)	**Organic Vapor Analyzer**

DESCRIPTIVE SOIL CLASSIFICATION

Soil classification is based on the Unified Soil Classification System. Coarse Grained Soils have more than 50% of their dry weight retained on a #200 sieve; their principal descriptors are: boulders, cobbles, gravel or sand. Fine Grained Soils have less than 50% of their dry weight retained on a #200 sieve; they are principally described as clays if they are plastic, and silts if they are slightly plastic or non-plastic. Major constituents may be added as modifiers and minor constituents may be added according to the relative proportions based on grain size. In addition to gradation, coarse-grained soils are defined on the basis of their in-place relative density and fine-grained soils on the basis of their consistency.

LOCATION AND ELEVATION NOTES

Unless otherwise noted, Latitude and Longitude are approximately determined using a hand-held GPS device. The accuracy of such devices is variable. Surface elevation data annotated with +/- indicates that no actual topographical survey was conducted to confirm the surface elevation. Instead, the surface elevation was approximately determined from topographic maps of the area.

STRENGTH TERMS

RELATIVE DENSITY OF COARSE-GRAINED SOILS (More than 50% retained on No. 200 sieve.) Density determined by Standard Penetration Resistance		CONSISTENCY OF FINE-GRAINED SOILS (50% or more passing the No. 200 sieve.) Consistency determined by laboratory shear strength testing, field visual-manual procedures or standard penetration resistance		
Descriptive Term (Density)	**Standard Penetration or N-Value Blows/Ft.**	**Descriptive Term (Consistency)**	**Unconfined Compressive Strength Qu, (tsf)**	**Standard Penetration or N-Value Blows/Ft.**
Very Loose	0 - 3	Very Soft	less than 0.25	0 - 1
Loose	4 - 9	Soft	0.25 to 0.50	2 - 4
Medium Dense	10 - 29	Medium Stiff	0.50 to 1.00	4 - 8
Dense	30 - 50	Stiff	1.00 to 2.00	8 - 15
Very Dense	> 50	Very Stiff	2.00 to 4.00	15 - 30
		Hard	> 4.00	> 30

RELATIVE PROPORTIONS OF SAND AND GRAVEL

Descriptive Term(s) of other constituents	Percent of Dry Weight
Trace	< 15
With	15 - 29
Modifier	> 30

GRAIN SIZE TERMINOLOGY

Major Component of Sample	Particle Size
Boulders	Over 12 in. (300 mm)
Cobbles	12 in. to 3 in. (300mm to 75mm)
Gravel	3 in. to #4 sieve (75mm to 4.75 mm)
Sand	#4 to #200 sieve (4.75mm to 0.075mm
Silt or Clay	Passing #200 sieve (0.075mm)

RELATIVE PROPORTIONS OF FINES

Descriptive Term(s) of other constituents	Percent of Dry Weight
Trace	< 5
With	5 - 12
Modifier	> 12

PLASTICITY DESCRIPTION

Term	Plasticity Index
Non-plastic	0
Low	1 - 10
Medium	11 - 30
High	> 30

Terracon

Exhibit: C-1

UNIFIED SOIL CLASSIFICATION SYSTEM

Criteria for Assigning Group Symbols and Group Names Using Laboratory Tests [A]					Soil Classification	
					Group Symbol	Group Name [B]
Coarse Grained Soils: More than 50% retained on No. 200 sieve	**Gravels:** More than 50% of coarse fraction retained on No. 4 sieve	**Clean Gravels:** Less than 5% fines [C]	Cu ≥ 4 and 1 ≤ Cc ≤ 3 [E]		GW	Well-graded gravel [F]
			Cu < 4 and/or 1 > Cc > 3 [E]		GP	Poorly graded gravel [F]
		Gravels with Fines: More than 12% fines [C]	Fines classify as ML or MH		GM	Silty gravel [F,G, H]
			Fines classify as CL or CH		GC	Clayey gravel [F,G,H]
	Sands: 50% or more of coarse fraction passes No. 4 sieve	**Clean Sands:** Less than 5% fines [D]	Cu ≥ 6 and 1 ≤ Cc ≤ 3 [E]		SW	Well-graded sand [I]
			Cu < 6 and/or 1 > Cc > 3 [E]		SP	Poorly graded sand [I]
		Sands with Fines: More than 12% fines [D]	Fines classify as ML or MH		SM	Silty sand [G,H,I]
			Fines Classify as CL or CH		SC	Clayey sand [G,H,I]
Fine-Grained Soils: 50% or more passes the No. 200 sieve	**Silts and Clays:** Liquid limit less than 50	**Inorganic:**	PI > 7 and plots on or above "A" line [J]		CL	Lean clay [K,L,M]
			PI < 4 or plots below "A" line [J]		ML	Silt [K,L,M]
		Organic:	Liquid limit - oven dried	< 0.75	OL	Organic clay [K,L,M,N]
			Liquid limit - not dried			Organic silt [K,L,M,O]
	Silts and Clays: Liquid limit 50 or more	**Inorganic:**	PI plots on or above "A" line		CH	Fat clay [K,L,M]
			PI plots below "A" line		MH	Elastic Silt [K,L,M]
		Organic:	Liquid limit - oven dried	< 0.75	OH	Organic clay [K,L,M,P]
			Liquid limit - not dried			Organic silt [K,L,M,Q]
Highly organic soils:	Primarily organic matter, dark in color, and organic odor				PT	Peat

[A] Based on the material passing the 3-in. (75-mm) sieve
[B] If field sample contained cobbles or boulders, or both, add "with cobbles or boulders, or both" to group name.
[C] Gravels with 5 to 12% fines require dual symbols: GW-GM well-graded gravel with silt, GW-GC well-graded gravel with clay, GP-GM poorly graded gravel with silt, GP-GC poorly graded gravel with clay.
[D] Sands with 5 to 12% fines require dual symbols: SW-SM well-graded sand with silt, SW-SC well-graded sand with clay, SP-SM poorly graded sand with silt, SP-SC poorly graded sand with clay

[E] $Cu = D_{60}/D_{10}$ $\quad Cc = \dfrac{(D_{30})^2}{D_{10} \times D_{60}}$

[F] If soil contains ≥ 15% sand, add "with sand" to group name.
[G] If fines classify as CL-ML, use dual symbol GC-GM, or SC-SM.
[H] If fines are organic, add "with organic fines" to group name.
[I] If soil contains ≥ 15% gravel, add "with gravel" to group name.
[J] If Atterberg limits plot in shaded area, soil is a CL-ML, silty clay.
[K] If soil contains 15 to 29% plus No. 200, add "with sand" or "with gravel," whichever is predominant.
[L] If soil contains ≥ 30% plus No. 200 predominantly sand, add "sandy" to group name.
[M] If soil contains ≥ 30% plus No. 200, predominantly gravel, add "gravelly" to group name.
[N] PI ≥ 4 and plots on or above "A" line.
[O] PI < 4 or plots below "A" line.
[P] PI plots on or above "A" line.
[Q] PI plots below "A" line.

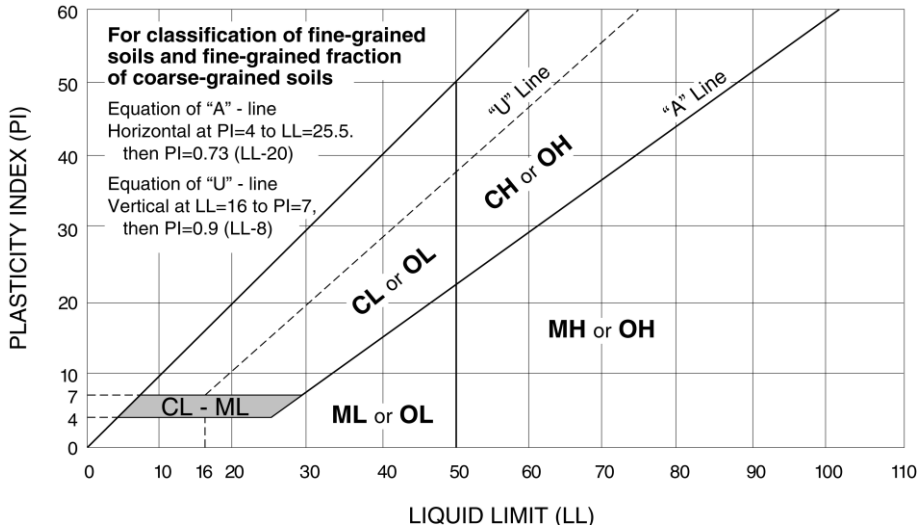


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Exhibit C-2

SECTION 004100 – BID PROPOSAL FORM

PART 1 - THE PROJECT AND THE PARTIES

1.1 OWNER: City of League City
300 W. Walker Street, League City, Texas 77573.

FOR: Hometown Heroes Park Restrooms, ZCA Project No. 1108801.

1.2 DATE: _____ (Bidder to enter date).

1.3 SUBMITTED BY: (Bidder to enter name and address)

A. Bidder's Full Name: _____.

1. Address _____.

2. City, State, Zip_____.

1.4 Reference Section 011000 – Summary and Drawings for additional information concerning Scope of Work.

1.5 BASE BID

A. Having examined the Place of Work and all matters referred to in the Contract Documents prepared by ZCA for the above mentioned project, we, the undersigned, hereby offer to enter into a Contract to perform the Work for the Price of:

B. _____.

_____. dollars

($_____), in lawful money of the United States of America.

1.6 SCHEDULE OF CONTINGENCIES, ALLOWANCES AND FEES

A. General Contingency: Include the sum of $10,000.00 as a General Contingency for this project.

B. Reference Section 012100 – Allowances: Include the sum of $2,000 for signage on this project.

C. Provide builders risk insurance; performance and payment bonds, bid guarantee, building permit fees; and temporary facilities in Base Bid prices.

D. Provide an itemized Schedule of Values of each item by CSI spec section per Table of Contents.

1.7 ACCEPTANCE

A. This offer shall be open to acceptance and is irrevocable for sixty (60) days from the bid closing date.

B. If this bid is accepted by Owner within the time period stated above, we will:
1. Execute the Agreement within seven (7) days of receipt of Notice of Award.
2. Commence work within seven (7) days after Permit is acquired and written Notice to Proceed is issued.

1.8 CONTRACT TIME

A. If this Bid is accepted, we will complete the Work in _____ calendar days from Notice to Proceed. Include all anticipated Rain Days in schedule.

1.9 CHANGES TO THE WORK

A. When Architect establishes that the method of valuation for Changes in the Work will be net cost plus a percentage fee in accordance with General Conditions, our percentage fee will be:
1. _____ percent overhead and profit on the net cost of our own Work.
2. _____ percent on the cost of work done by any Subcontractor.

1.10 ADDENDA

A. The following Addenda have been received. The modifications to the Bid Documents noted below have been considered and all costs are included in the Bid Price.
1. Addendum #____ Dated _____.
2. Addendum #____ Dated _____.
3. Addendum #____ Dated _____.
4. Addendum #____ Dated _____.
5. Addendum #____ Dated _____.

1.11 SUBCONTRACTOR LIST

A. Provide a list of all subcontractors and major suppliers you intend to use on this project. Include their insurance limits, bonding capacity, and a list of similar projects they have constructed in the last 5 years. At owner's option, provide Performance and Payment Bonds of all sub-contractors and major suppliers as a separate price.

1.12 BID FORM SIGNATURE(S)

A. The Corporate Seal of

B. _____

C. (Bidder – print the full name of your firm)

D. Was hereunto affixed in the presence of:

E. _____

F. (Authorized signing officer, Title)

G. (Seal)

H. _____

I. (Authorized signing officer, Title)

END OF SECTION 004100

City of League City
House Bill 89 Verification

I, _____(Person name), the undersigned

representative of_(Company or Business name)_____

_____

_____(hereafter referred to as company) being an adult over the age of eighteen (18) years of age, after being duly sworn by the undersigned notary, do hereby depose and verify under oath that the company named-above, under the provisions of Subtitle F, Title 10, Government Code Chapter 2270:

1. Does not boycott Israel currently; and
2. Will not boycott Israel during the term of the contract.

Pursuant to Section 2270.001, Texas Government Code:

1. *"Boycott Israel" means refusing to deal with, terminating business activities with, or otherwise taking any action that is intended to penalize, inflict economic harm on, or limit commercial relations specifically with Israel, or with a person or entity doing business in Israel or in an Israeli-controlled territory, but does not include an action made for ordinary business purposes; and*
2. *"Company" means a for-profit sole proprietorship, organization, association, corporation, partnership, joint venture, limited partnership, limited liability partnership, or any limited liability company, including a wholly owned subsidiary, majority-owned subsidiary, parent company or affiliate of those entities or business associations that exist to make a profit.*

_____ _____

DATE SIGNATURE OF COMPANY REPRESENTATIVE

On this the _____ day of _____, 20____, personally appeared _____, the above-named person, who after by me being duly sworn, did swear and confirm that the above is true and correct.

NOTARY SEAL

_____

NOTARY SIGNATURE

_____

Date

Texas Public Information Act

Steps to Assert that Information is Confidential or Proprietary

All proposals, data, and information submitted to the City of League City are subject to release under the Texas Public Information Act ("Act") unless exempt from release under the Act. You are not encouraged to submit data and/or information that you consider to be confidential or proprietary unless it is absolutely required to understand and evaluate your submission.

On each page where confidential or proprietary information appears, you must label the confidential or proprietary information. Do not label every page of your submission as confidential as there are pages (such as the certification forms and bid sheet with pricing) that are not confidential. It is recommended that each page that contains either confidential or proprietary information be printed on colored paper (such as yellow or pink paper). At a minimum, the pages where the confidential information appears should be labeled and the information you consider confidential or proprietary clearly marked.

Failure to label the actual pages on which information considered confidential appears will be considered as a waiver of confidential or proprietary rights in the information.

In the event a request for public information is filed with the City which involves your submission, you will be notified by the City of the request so that you have an opportunity to present your reasons for claims of confidentiality to the Texas Attorney General.

In signing this form, I acknowledge that I have read the above and further state (Please check one):

☐ The proposal/bid submitted to the City **contains NO confidential information** and may be released to the public if required under the Texas Public Information Act.

☐ The proposal/bid submitted **contains confidential information** which is labeled and which may be found on the following pages: _____
and any information contained on page number not listed above may be released to the public if required under the Texas Public Information Act.

Vendor/Proposer Submitting: _____

Signature:_____ Date:_____

Print Name:_____ Print Title:_____

PLEASE SIGN AND RETURN WITH PROPOSAL/BID

BID BOND

STATE OF TEXAS SURETY'S NO. _____

COUNTY OF _____

KNOW ALL MEN BY THESE PRESENTS that _____ (hereinafter called the "Principal"), as Principal, and _____, (hereinafter called the "Surety"), as Surety, are held and firmly bound unto the City of League City, Texas (hereinafter called the "Obligee"), in the amount of _____ _____ Dollars ($_____), for the payment whereof the said Principal and Surety bind themselves and their heirs, administrators, executors, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, the Principal has submitted a Bid or Proposal to enter into a certain written Contract with the Obligee to _____

_____

_____

NOW, THEREFORE, the condition of this obligation is such that if the said Principal shall faithfully enter into such written Contract, then this obligation shall be void but otherwise, shall remain in full force and effect.

IT IS EXPRESSLY UNDERSTOOD AND AGREED that if said Principal should withdraw its Bid at any time after such Bid is opened but before official rejection of such Bid or, if successful in securing the award thereof, said Principal should fail to enter into the Contract and furnish satisfactory Performance Bond and Payment Bond, if required, the Obligee, in either of such events, shall be entitled and is hereby given the right to collect the full amount of this Bid Bond as liquidated damages.

Provided further that if any legal action be filed upon this Bond, venue shall lie in Galveston County, Texas.

IN WITNESS WHEREOF, the said Principal and Surety do sign and seal this instrument this _____ day of _____, 20__.

_____	_____
Principal	Surety
By: _____	By:_____
Address: _____	Address: _____
_____	_____

PERFORMANCE BOND

STATE OF TEXAS

COUNTY OF GALVESTON KNOW ALL MEN BY THESE PRESENTS:

THAT WE, _____, as Principal, (the "Contractor"), and the other subscriber hereto, _____, as Surety, do hereby acknowledge ourselves to be held and firmly bound to the City of League City (the "City"), a municipal corporation, in the penal sum of $ _____(_____) for the payment of which sum, well and truly to be made to the City, its successors and assigns, Contractor and Surety to bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally.

THE CONDITIONS OF THIS OBLIGATION ARE SUCH THAT:

WHEREAS, the Contractor has on or about this day executed a contract in writing with the City for

***Hometown Heroes Park Restrooms Project* (PK 1905)**

ITB# 19-CIP-043

all of such work to be done as set out in full in said Contract documents therein referred to and adopted by the City Council, all of which are made a part of this instrument as fully and completely as if set out in full herein.

NOW THEREFORE, if the said Contractor shall faithfully and strictly perform the Contract in all its terms, provisions, and stipulations in accordance with its true meaning and effect, and in accordance with the Contract documents referred to therein and shall comply strictly with each and every provision of the Contract and with this Bond, then this obligation shall become null and void and shall have no further force and effect; otherwise the same is to remain in full force and effect. Should the Contractor fail to faithfully and strictly perform the Contract in all its terms, including but not limited to the indemnifications thereunder, the Surety shall be liable for all damages, losses, expenses and liabilities that the City may suffer in consequence thereof, as more fully set forth herein.

IT IS FURTHER PROVIDED herein that pursuant to this undertaking, the Principal hereof and the Surety shall both be bound for such period of warranty as shall be expressed and set out in the General Conditions of Agreement, under the terms and conditions thereof for a period of one (1) year as is provided for in Chapter 2253, Texas Government Code, as amended.

It is further understood and agreed that the Surety does hereby relieve the City or its representatives from the exercise of any diligence whatever in securing compliance on the part of the Contractor with the terms of the Contract, and the Surety agrees that it shall be bound to take notice of and shall be held to have knowledge of all acts or omissions of the Contractor in all matters pertaining to the Contract. The Surety understands and agrees that the provision in the Contract that the City will retain certain amounts due the Contractor until the expiration of 30 days from the acceptance of the Work is intended for the City's benefit, and the City will have the right to pay or withhold such retained amounts or any other amount owing under the Contract without changing or affecting the liability of the Surety hereon in any degree.

It is further expressly agreed by Surety that the City or its representatives are at liberty at any time, without notice to the Surety, to make any change in the Contract documents and in the Work to be done thereunder, as provided in the Contract, and in the terms and conditions thereof, or to make any extension of time, any change in, addition to, or deduction from the Work to be done thereunder; and that such changes, if made, shall not in any way vitiate the obligation in this Bond and undertaking or release the Surety therefrom.

It is further expressly agreed and understood that the Contractor and Surety will fully indemnify, defend and save harmless the City from any liability, loss, cost, expense, or damage arising out of Contractor's performance of the Contract.

If the City gives Surety notice of Contractor's default, Surety shall, within 45 days, take one of the following actions:

1. Arrange for Contractor, with consent to the City, to perform and complete the Contract; or

2. Take over and assume completion of the Contract itself, through its agents or through independent contractors, and become entitled to the payment of the balance of the Contract Price.

If the Surety fails to take either of the actions set out above, it shall be deemed to have waived its right to perform and complete the Contract and receive payment of the balance of the Contract Price and the City shall be entitled to enforce any remedies available at law, including but not limited to completing the Contract itself and recovering any cost in excess of the Original Contract price from the Surety.

This Bond and all obligations created hereunder shall be performable in Galveston County, Texas. This Bond is given in compliance with the provisions of Chapter 2253, Texas Government Code, as amended, which is incorporated herein by this reference.

Notices required or permitted hereunder shall be in writing and shall be deemed delivered when actually received or, if earlier, on the third day following deposit in a United States Postal Service post office or receptacle, with proper postage affixed (certified mail, return receipt requested), addressed to the respective other Party at the address prescribed in the Contract documents, or at such other address as the receiving party may hereafter prescribe by written notice to the sending party.

IN WITNESS THEREOF, the said Contractor and Surety have signed and sealed this instrument on the respective dates written below their signatures and have attached current Power of Attorney.

ATTEST, SEAL: (if a corporation)

Witness: (if not a corporation)

By: _____

Name: _____

Title: _____

_____

Name of Contractor

By: _____

Name: _____

Title: _____

Date: _____

ATTEST/SURETY WITNESS:

(SEAL)

By: _____

Name: _____

Title: _____

_____

Full Name of Surety

_____

Address of Surety for Notice

_____

_____

_____

Telephone Number of Surety:

By: _____

Name: _____

Title: Attorney in Fact

Date: _____

PAYMENT BOND

STATE OF TEXAS

COUNTY OF GALVESTON KNOW ALL MEN BY THESE PRESENTS:

THAT WE, _____, as Principal, (the "Contractor"), and the other subscriber hereto, _____, as Surety, do hereby acknowledge ourselves to be held and firmly bound to City of League City (the "City"), a municipal corporation, in the penal sum of $_____($_____) for the payment of which sum, well and truly to be made to the Owner, its successors and assigns, Contractor and Surety to bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally.

THE CONDITIONS OF THIS OBLIGATION ARE SUCH THAT:

WHEREAS, the Contractor has on or about this day executed a contract in writing with the Owner for

***Hometown Heroes Park Restrooms Project* (PK 1905)**

ITB# 19-CIP-043

all of such work to be done as set out in full in said Contract documents therein referred to and adopted by the City Council, all of which are made a part of this instrument as fully and completely as if set out in full herein.

NOW, THEREFORE, if the said Contractor shall pay all claimants supplying labor and materials to him or a Subcontractor in the prosecution of the Work provided for in the Contract, then, this obligation shall be void; otherwise the same is to remain in full force and effect;

PROVIDED HOWEVER, that this Bond is executed pursuant to the provisions of Chapter 2253, Texas Government Code, as amended, and all liabilities on this Bond shall be determined in accordance with the provisions of said Article to the same extent as if it were copied at length herein.

IN WITNESS THEREOF, the said Contractor and Surety have signed and sealed this instrument on the respective dates written below their signatures and have attached current Power of Attorney.

ATTEST, SEAL: (if a corporation) _____

Witness: (if not a corporation)

By: _____

Name: _____

Title: _____

Name of Contractor:

By: _____

Name: _____

Title: _____

Date: _____

ATTEST/SURETY WITNESS: _____

Full Name of Surety

(SEAL)

_____

Address of Surety for Notice

_____

_____

_____

Telephone Number of Surety

By: _____

Name: _____

Title: _____

By: _____

Name: _____

Title: Attorney in Fact

Date: _____

STANDARD AGREEMENT

(version 9-9-2019)

This AGREEMENT ("Agreement") is entered by and between **Click or tap here to enter text.** ("Contractor"), located at **Click or tap here to enter text.** and the **City of League City** ("City"), a home-rule municipality, located at 300 W. Walker St., League City, Texas 77573 on the date set forth below.

Terms:

1. **Scope of Services:** Contractor will perform the services and/or provide the products as set forth in **Exhibit A**, which is attached and incorporated herein, and which can be generally described as **Click or tap here to enter text.**. If there is a conflict between the terms of this Agreement and Exhibit A, the terms of this Agreement will prevail.

2. **Term and Termination:** This Agreement shall commence on **Click or tap to enter a date.** and shall expire on **Click or tap to enter a date.** The period from commencement to expiration is the Contract Term. City reserves the right to terminate this Agreement for convenience upon seven (7) days written notice to Contractor. Upon such termination, City shall pay Contractor, at the rate set out in **Exhibit A,** for services satisfactorily performed or products satisfactorily provided up through the date of termination. Notwithstanding any provision in this Agreement to the contrary, City will not be required to pay or reimburse Contractor for any services performed or for expenses incurred by Contractor after the date of the termination notice that could have been avoided or mitigated by Contractor.

3. **Compensation:** Contractor shall be paid for the services/products as set forth in **Exhibit A**. In no event shall the total compensation exceed $**Click or tap here to enter text.** during the term of this Agreement. City shall tender payment (including progress/partial payments) for services/goods only after such services are completed or goods are delivered and are deemed to be acceptable under this Agreement, in the sole reasonable discretion of City. Contractor must submit to City invoices for all goods delivered and services provided, which invoices must include details and dates of service or delivery. Payment by City shall be made within thirty (30) days of receipt of an invoice, except for any portion of the invoiced amount that City disapproves as not compliant under this Agreement, in the sole reasonable discretion of City. If City disapproves any amount submitted for payment by Contractor, City shall give Contractor specific reasons for disapproval in writing.

4. **Insurance:** Contractor **Choose an item.** required during the Contract Term to maintain insurance as follows: (a) Comprehensive General Commercial Liability insurance covering bodily injury and property damage, with minimum coverage limits—exclusive of defense costs—of $1,000,000 per occurrence and $2,000,000 aggregate; (b) If Contractor will provide City "professional services," as that term is used in Chapter 252 of the Texas Local Government Code, Professional Liability (errors and omissions/malpractice) insurance with minimum coverage limits—exclusive of defense costs—of $2,000,000 per occurrence; and (c) If at any point during the Contract Term it is foreseeable that Contractor will enter upon City premises: (i) Worker's Compensation coverage with statutory limits for the State of Texas, and (ii) Commercial Automobile Liability coverage with minimum coverage limits—exclusive of defense costs—of $1,000,000 per occurrence and $2,000,000 aggregate. All policies must contain a waiver of subrogation against City. Comprehensive General Liability and Commercial Automobile Liability policies must name the City as Additional Insured. Contractor shall pay all insurance deductibles and deductibles must not exceed $10,000 unless approved in advance by City. Contractor shall provide City Certificates of Insurance evidencing these insurance requirements prior to the start of work.

5. **Liquidated Damages:** Contractor acknowledges that time is of the essence in performing this Agreement. City and Contractor (collectively, the "Parties") agree that if Contractor is late in performing any obligation of this Agreement, City will suffer loss, damages, or other harm from Contractor's delay. The Parties agree that the amount of loss, damages, or harm likely to be incurred is incapable or difficult to precisely estimate, and therefore Contractor agrees to pay City liquidated damages for delay at a daily rate equal to the total compensation allowed under the Agreement divided by the number of days in the Contract Term. The Parties further agree that: (i) the liquidated damages specified herein are not a penalty but rather bear a reasonable relationship to, and is not plainly or grossly disproportionate to, the probable loss likely to be incurred by City as a result of Contractor's delay; (ii) one of the reasons for City and Contractor to agree to such amounts is the uncertainty and cost of litigation regarding the question of actual damages; and (iii) City and Contractor are sophisticated business parties and negotiated this Agreement at arm's length.

6. **Independent Contractor:** Contractor is an independent contractor and is not an employee, partner, joint venture, or agent of City. Contractor understands and agrees that he/she will not be entitled to any benefits generally available to City employees. Contractor shall be responsible for all expenses necessary to carry out the services under this Agreement and shall not be reimbursed by City for such expenses except as otherwise provided in this Agreement.

7. **Intellectual Property:** This Agreement shall be an Agreement for services and the parties intend and consider any work created as a result of this Agreement, including any and all documentation, images, products or results, to be a work (the "Work") for hire under federal copyright law. Ownership of the Work shall belong to and remain the exclusive property of City. The Work may be edited at any time within City's discretion. If the Work would not be considered a work-for-hire under applicable law, Contractor hereby assigns, transfers, and conveys any and all rights, title and interest to City, including without limitation all copyrights, patents, rights of reproduction, rights to ownership, and right to secure registrations, renewals, reissues and extensions thereof. As the sole copyright holder of the Work, City maintains and asserts the rights to use, reproduce, make derivative works from, and/or edit the Work in any form of medium, expression or technology now known or hereafter developed, at any time within City's discretion. Contractor shall not sell, disclose or obtain any other compensation for the services provided herein or the Work. If the Work is one to which the provisions of 17 U.S.C. § 106A apply, Contractor hereby waives and appoints City to assert on Contractor's behalf Contractor's moral rights or any equivalent rights regarding the form or extent of any alteration to the Work (including, without limitation, removal or destruction) or the making of any derivative works based on the Work, including, without limitation, photographs, drawings or other visual reproductions of the work, in any medium, for City's purposes.

8. **Confidentiality:** During the course of the services to be provided under this Agreement, Contractor may become privy to confidential information of City. Contractor agrees to treat as confidential the information or knowledge that becomes known to Contractor during performance of this Agreement and to not use, copy, or disclose such information to any third party unless authorized in writing by City. This provision does not restrict the disclosure of any information that is required to be disclosed under applicable law. Contractor shall promptly notify City of any misuse or unauthorized disclosure of City's confidential information and upon expiration of this Agreement shall return to City all confidential information in Contractor's possession or control. Contractor shall further comply with all information security policies of City that may apply and shall not make any press releases, public statements or advertisement referring to the services provided under this Agreement or the engagement of Contractor without the prior written approval of City.

9. **Warranties and Representations:** Contractor warrants and agrees that Contractor shall perform its services and conduct all operations in conformity with all applicable federal, state, and local laws, rules, regulations, and ordinances. For any service performed on premises owned or controlled by City, Contractor warrants and agrees that Contractor will perform said services in compliance with all City rules, including but not limited to, prohibitions related to tobacco use, alcohol, and other drugs.

10. **Licenses/Certifications:** Contractor represents and warrants that it will obtain and maintain in effect, and pay the cost of, all licenses, permits or certifications that may be necessary for Contractor's performance of this Agreement. If Contractor is a business entity, Contractor warrants, represents, covenants, and agrees that it is duly organized, validly existing and in good standing under the laws of the state of its formation; and is duly authorized and in good standing to conduct business in the State of Texas, that it has all necessary power and has received all necessary approvals to execute and deliver the Agreement and is authorized to execute this Agreement according to its terms on behalf of Contractor.

11. **Performance/Qualifications:** Contractor agrees and represents that Contractor has the personnel, experience, and knowledge necessary to qualify Contractor for the particular duties to be performed under this Agreement. Contractor warrants that all services performed under this Agreement shall be performed consistent with generally prevailing professional or industry standards.

12. **Conflict of Interest:** Contractor warrants, represents, and agrees that Contractor presently has no interest and shall not acquire any interest, direct or indirect, that would conflict in any manner or degree with Contractor's performance of the services hereunder. Contractor further warrants and affirms that no relationship or affiliation exists between Contractor and City that could be construed as a conflict of interest with regard to this Agreement.

13. **INDEMNIFICATION: CONTRACTOR SHALL DEFEND, INDEMNIFY AND HOLD HARMLESS CITY , AND EACH OF ITS OFFICIALS, OFFICERS, AGENTS AND EMPLOYEES FROM AND AGAINST ALL CLAIMS, ACTIONS, SUITS, DEMANDS, PROCEEDINGS, COSTS, DAMAGES AND LIABILITIES, INCLUDING WITHOUT LIMITATION ATTORNEYS' FEES AND REASONABLE LITIGATION COSTS, ARISING OUT OF, CONNECTED WITH, OR RESULTING FROM ANY ACTS OR OMISSIONS OF CONTRACTOR OR ANY AGENT, EMPLOYEE, SUBCONTRACTOR, OR SUPPLIER OF CONTRACTOR IN THE EXECUTION OR PERFORMANCE OF THIS CONTRACT, TO THE EXTENT THE CLAIM ARISES FROM NEGLIGENCE, WILLFUL ACT, BREACH OF CONTRACT OR VIOLATION OF LAW.**

14. **Force Majeure:** Neither City nor Contractor shall be liable for any delay in the performance of this Agreement, nor for any other breach, nor for any loss or damage arising solely from uncontrollable forces such as fire, theft, storm, war, or any other force majeure that could not have been reasonably avoided by the exercise of due diligence.

15. **Notices:** Any notice given under this Agreement by either party to the other may be effected either by personal delivery in writing or by mail, registered or certified postage prepaid with return receipt requested. Mailed notices shall be addressed to the addresses of the Parties as they appear in the contract. Notices delivered personally shall be deemed communicated at the time of actual receipt. Mailed notices shall be deemed communicated three (3) days after mailing.

16. **Texas Family Code Child Support Certification:** Pursuant to Section 231.006 of the Texas Family Code, Contractor certifies that it is not ineligible to receive the award of or payments under the Agreement and acknowledges that the Agreement may be terminated, and payment may be withheld if this certification is inaccurate.

17. **State and/or City Auditor:** Contractor understands that acceptance of funds under the Agreement constitutes acceptance of the authority of the Texas State Auditor's Office, or any successor agency or the City's internal auditor (collectively, the "Auditor"), to conduct an audit or investigation in connection with those funds. Contractor agrees to cooperate with the Auditor in the conduct of the audit or investigation, including without limitation providing all records requested. Contractor will include this provision in all contracts with permitted subcontractors.

18. **Jurisdiction:** Any disputes under this Agreement shall be brought in a court of competent jurisdiction in Galveston, Texas and governed by Texas law.

19. **Alternative Dispute Resolution:** To the extent that Chapter 2260, Texas Government Code, is applicable to this Contract and is not preempted by other applicable law, the dispute resolution process provided for in Chapter 2260 and the related rules adopted by the Texas Attorney General Pursuant to Chapter 2260, shall be used by City and Contractor to attempt to resolve any claim for breach of contract made by Contractor that cannot be resolved in the ordinary course of business. The Director of Finance of City shall examine Contractor's claim and any counterclaim and negotiate with Contractor in an effort to resolve such claims. This provision shall not be construed as a waiver by City of its right to seek redress in the courts.

20. **Entire Agreement:** This Agreement contains the entire understanding between the Parties and supersedes all prior agreements, arrangements, and understanding, oral or written between the Parties relating to this Agreement. This Agreement may not be modified except by mutual written agreement of the Parties executed subsequent to this Agreement.

21. **Eligibility to Receive Payment:** Contractor certifies that, as a matter of state law, it is not ineligible to receive the Agreement and payments pursuant to the Agreement and acknowledges that the Agreement may be terminated, and payment withheld if this representation is inaccurate.

22. **Payment of Debt/Delinquency to State:** Contractor certifies that it is not indebted to the City of League City and is current on all taxes owed to the City of League City. Contractor agrees that any payments owing to Contractor under the Agreement may be applied directly toward any debt or delinquency that Contractor owes the City of League City regardless of when it arises, until such debt or delinquency is paid in full.

23. **Products and Materials Produced in Texas:** If Contractor will provide services under the Agreement, Contractor covenants and agrees that in performing its duties and obligations under the Agreement, it will purchase products and materials produced in Texas when such products and materials are available at a price and delivery time comparable to products and materials produced outside of Texas.

24. **Risk of Loss:** If applicable, all work performed by Contractor pursuant to the Agreement will be at Contractor's exclusive risk until final and complete acceptance of the work by City. In the case of any loss or damage to the work prior to City's acceptance, bearing such loss or damage will be Contractor's responsibility.

25. **Publicity:** Contractor shall not use City's name, logo or likeness in any press release, marketing materials or other public announcement without receiving City's prior written approval.

26. **Legal Construction/Severability:** In the event that any one or more of the provisions contained in this Agreement shall for any reason be held to be invalid, illegal or unenforceable in any respect, such invalidity, illegality or unenforceability shall not affect any other provision, and this Agreement shall be construed as if such invalid, illegal or unenforceable provisions had never been contained in it. To this end, the provisions of this Agreement are declared to be severable. The Parties may mutually agree to renegotiate the Agreement to cure such illegality/invalidity or unconstitutionality if such may be reasonably accomplished.

27. **Limitations:** The Parties are aware that there are constitutional and statutory limitations on the authority of City to enter into certain terms and conditions of the Agreement, including, but not limited to, those terms and conditions relating to liens on City's property; disclaimers and limitations of warranties; disclaimers and limitations of liability for damages; waivers, disclaimers and limitations of legal rights, remedies, requirements and processes; limitations of periods to bring legal action; granting control of litigation or settlement to another party; liability for acts or omissions of third parties; payment of attorneys' fees; dispute resolution; indemnities; and confidentiality (collectively, the "Limitations"). Any terms and conditions related to the Limitations will not be binding on City except to the extent authorized by the laws and Constitution of the State of Texas.

28. **Sovereign Immunity:** The Parties agree that neither the execution of the Agreement by City nor any other conduct, action or inaction of any City representative relating to the Agreement constitutes a waiver of sovereign immunity by City.

29. **Authority:** Contractor warrants and represents that Contractor has full power and authority to enter into and perform this Agreement and to make the grant of rights contained herein. The person signing on behalf of City represents that he/she has authority to sign this Agreement on behalf of City.

30. **Non-Waiver:** The Parties specifically agree that neither the occurrence of an event giving rise to a breach of contract claim nor the pendency of a claim constitute grounds for the suspension of performance by Contractor. No covenant or condition of this Agreement may be waived except by written consent of the waiving party. Forbearance or indulgence by one party in any regard whatsoever shall not constitute a waiver of the covenant or condition to be performed by the other party.

31. **Prohibition on Boycotting Israel:** Pursuant to Section 2270.002 of the Texas Government Code, by executing this Agreement Contractor verifies that Contractor: (1) does not boycott Israel; and (2) will not boycott Israel during the term of this Agreement.

32. **Prohibition Against Business with Iran, Sudan or Foreign Terrorists Organizations:** Contractor warrants, covenants, and represents that Contractor is not engaged in business with Iran, Sudan, or any company identified on the list referenced in Section 2252.152 of the Texas Government Code.

(signature block on next page)

Executed on this _____ day of _____, _____. *(date to be filled in by City Secretary)*

Click or tap here to enter text. - "Contractor"

_____

Click or tap here to enter text.

CITY OF LEAGUE CITY – "City"

_____

Click or tap here to enter text.

Attest:

_____

Diana Stapp, City Secretary

Approved as to Form:

_____

Office of the City Attorney

Exhibit A

Scope of Services/Description of Products/Payment Schedule
(There are Click or tap here to enter text. pages for Exhibit A, including this page)

Click or tap here to enter text.

CONFLICT OF INTEREST QUESTIONNAIRE

FORM CIQ

For vendor doing business with local governmental entity

This questionnaire reflects changes made to the law by H.B. 23, 84th Leg., Regular Session.

This questionnaire is being filed in accordance with Chapter 176, Local Government Code, by a vendor who has a business relationship as defined by Section 176.001(1-a) with a local governmental entity and the vendor meets requirements under Section 176.006(a).

By law this questionnaire must be filed with the records administrator of the local governmental entity not later than the 7th business day after the date the vendor becomes aware of facts that require the statement to be filed. *See* Section 176.006(a-1), Local Government Code.

A vendor commits an offense if the vendor knowingly violates Section 176.006, Local Government Code. An offense under this section is a misdemeanor.

OFFICE USE ONLY

Date Received

1 **Name of vendor who has a business relationship with local governmental entity.**

2 ☐ **Check this box if you are filing an update to a previously filed questionnaire.** (The law requires that you file an updated completed questionnaire with the appropriate filing authority not later than the 7th business day after the date on which you became aware that the originally filed questionnaire was incomplete or inaccurate.)

3 **Name of local government officer about whom the information is being disclosed.**

Name of Officer

4 **Describe each employment or other business relationship with the local government officer, or a family member of the officer, as described by Section 176.003(a)(2)(A). Also describe any family relationship with the local government officer. Complete subparts A and B for each employment or business relationship described. Attach additional pages to this Form CIQ as necessary.**

A. Is the local government officer or a family member of the officer receiving or likely to receive taxable income, other than investment income, from the vendor?

☐ Yes ☐ No

B. Is the vendor receiving or likely to receive taxable income, other than investment income, from or at the direction of the local government officer or a family member of the officer AND the taxable income is not received from the local governmental entity?

☐ Yes ☐ No

5 **Describe each employment or business relationship that the vendor named in Section 1 maintains with a corporation or other business entity with respect to which the local government officer serves as an officer or director, or holds an ownership interest of one percent or more.**

6 ☐ Check this box if the vendor has given the local government officer or a family member of the officer one or more gifts as described in Section 176.003(a)(2)(B), excluding gifts described in Section 176.003(a-1).

7

Signature of vendor doing business with the governmental entity

Date

CONFLICT OF INTEREST QUESTIONNAIRE
For vendor doing business with local governmental entity

A complete copy of Chapter 176 of the Local Government Code may be found at http://www.statutes.legis.state.tx.us/Docs/LG/htm/LG.176.htm. For easy reference, below are some of the sections cited on this form.

Local Government Code § 176.001(1-a): "Business relationship" means a connection between two or more parties based on commercial activity of one of the parties. The term does not include a connection based on:

(A) a transaction that is subject to rate or fee regulation by a federal, state, or local governmental entity or an agency of a federal, state, or local governmental entity;

(B) a transaction conducted at a price and subject to terms available to the public; or

(C) a purchase or lease of goods or services from a person that is chartered by a state or federal agency and that is subject to regular examination by, and reporting to, that agency.

Local Government Code § 176.003(a)(2)(A) and (B):

(a) A local government officer shall file a conflicts disclosure statement with respect to a vendor if:

***

(2) the vendor:

(A) has an employment or other business relationship with the local government officer or a family member of the officer that results in the officer or family member receiving taxable income, other than investment income, that exceeds $2,500 during the 12-month period preceding the date that the officer becomes aware that

(i) a contract between the local governmental entity and vendor has been executed; or

(ii) the local governmental entity is considering entering into a contract with the vendor;

(B) has given to the local government officer or a family member of the officer one or more gifts that have an aggregate value of more than $100 in the 12-month period preceding the date the officer becomes aware that:

(i) a contract between the local governmental entity and vendor has been executed; or

(ii) the local governmental entity is considering entering into a contract with the vendor.

Local Government Code § 176.006(a) and (a-1)

(a) A vendor shall file a completed conflict of interest questionnaire if the vendor has a business relationship with a local governmental entity and:

(1) has an employment or other business relationship with a local government officer of that local governmental entity, or a family member of the officer, described by Section 176.003(a)(2)(A);

(2) has given a local government officer of that local governmental entity, or a family member of the officer, one or more gifts with the aggregate value specified by Section 176.003(a)(2)(B), excluding any gift described by Section 176.003(a-1); or

(3) has a family relationship with a local government officer of that local governmental entity.

(a-1) The completed conflict of interest questionnaire must be filed with the appropriate records administrator not later than the seventh business day after the later of:

(1) the date that the vendor:

(A) begins discussions or negotiations to enter into a contract with the local governmental entity; or

(B) submits to the local governmental entity an application, response to a request for proposals or bids, correspondence, or another writing related to a potential contract with the local governmental entity; or

(2) the date the vendor becomes aware:

(A) of an employment or other business relationship with a local government officer, or a family member of the officer, described by Subsection (a);

(B) that the vendor has given one or more gifts described by Subsection (a); or

(C) of a family relationship with a local government officer.

ONE-YEAR MAINTENANCE BOND

THE STATE OF TEXAS §

§ KNOW ALL MEN BY THESE PRESENTS:

THE COUNTY OF GALVESTON §

THAT WE, _____, as Principal, hereinafter called "Contractor", and the other subscriber hereto _____, as Surety, do hereby acknowledge ourselves to be held and firmly bound to the (Owner), a municipal corporation, in the sum of _____($_____) for the payment of which sum well and truly to be made to the City of League City and its successors, the said Contractor and Surety do bind themselves, their heirs, executors, administrators, successors and assigns jointly and severally.

THE CONDITIONS OF THIS OBLIGATION ARE SUCH THAT:

WHEREAS, the Contractor has on or about this day executed a Contract in writing with the City of League City for ***Hometown Heroes Park Restrooms Project (PK 1905)*** all of such work to be done as set out in full in said Contract Documents therein referred to and adopted by the Owner, all of which are made a part of this instrument as fully and completely as if set out in full herein.

NOW THEREFORE, if said Contractor shall comply with the provisions of Subparagraph 4.28 of the General Conditions, and correct Work not in accordance with the Contract Documents discovered within the established one-year period, then this obligation shall become null and void, and shall be of no further force and effect; otherwise, the same is to remain in full force and effect.

Notices required or permitted hereunder shall be in writing and shall be deemed delivered when actually received or, if earlier, on the third day following deposit in a United States Postal Service post office or receptacle, with proper postage affixed (certified mail, return receipt requested), addresses to the respective other party at the address prescribed in the Contract Documents, or at such other address as the receiving party may hereafter prescribe by written notice to the sending party.

IN WITNESS THEREOF, the said Contractor and Surety have signed and sealed this instrument on the _____ day of _____, 20___, and have attached current Power of Attorney.

ATTEST, SEAL: (if a corporation)
WITNESS: (if not a corporation)

_____
(Name of Contractor)

By:_____
Name:
Title:

By: _____
Name:
Title:

ATTEST/ SURETY WITNESS: (SEAL)

_____
(Full Name of Surety)

_____
(Address of Surety for Notice)

_____
(Telephone Number of Surety)

By: _____
Name:
Title:

By: _____
Name:
Title:

Insert Contractor’s Insurance

DOCUMENT 00 70 00 – GENERAL CONDITIONS

1.01 CONTRACT FOR CONSTRUCTION

A Contract for Construction will be executed by the Owner, City of League City, and the Contractor identified in the Agreement. Conditions of the Contract are based on the League City Standard Agreement Form and League City General Conditions of Agreement along with the AIA A 201, "General Conditions of the Contract for Construction" (2007). These contract conditions and supplementary conditions are available to the Contractor.

Contract shall also include other contract forms and requirements attached to the end of this section in the Project Manual.

In event of a direct conflict between the League City Standard Agreement Form / League City General Conditions and the AIA Document A201-2007, the League City Standard Agreement Form / League City General Conditions shall control. As a courtesy, the Owner, Architect and/or General Contractor shall make all parties aware of any direct conflict between the AIA A201-2007 and the League City Standard Agreement Form / League City General Conditions that each party, respectively, encounters.

1.02 SUPPLEMENTARY CONDITIONS

A. General: Subject to negotiation with between the Owner and the Contractor, AIA A 201 will be modified as agreed to by both parties. Modifications may include, but not be limited to the following:

1. Retainage.
2. Construction Bonds.
3. Insurance.

END OF DOCUMENT

GENERAL CONDITIONS OF AGREEMENT

1. DEFINITIONS AND INTERPRETATION

1.01 OWNER, CONTRACTOR AND ENGINEER. The Owner, the CONTRACTOR and the ENGINEER are those persons or organizations identified as such in the Agreement. The term ENGINEER means a person authorized to act as a representative of the entity designated by the Owner to provide engineering or other ENGINEER services required in connection with the preparation and performance of this Contract.

1.02 CONTRACT DOCUMENTS. The contract documents shall consist of all of the documents contained, assembled and bound with these General Conditions of Agreement, including, whether or not labeled as such, Notice to Bidders (Advertisement), General Instructions to Bidders, Subcontractors and Major Suppliers Form, Bid Proposal, signed Agreement, Performance, Payment and One Year Maintenance Bonds (if required), Special Bonds (when required), General Conditions of Agreement, Special Conditions of Agreement (if any), Insurance Certificate, Technical Specifications, Plans and all modifications thereof incorporated in any of the documents before the execution of the Agreement, and any other document, whether or not labeled, which shall become a part of the set of documents bound together with the General Conditions of Agreement.

The contract documents are complementary, and what is called for by any one shall be as binding as if called for by all. Any conflicts between any of the contract documents shall be resolved first by reference to these General Conditions of Agreement; and in the event the General Conditions of Agreement do not address such conflict, then the designated ENGINEER shall resolve any conflict by a written interpretation, copies of which shall be forwarded to all parties to the Contract, and the original shall be attached to and shall become a part of these General Conditions of Agreement and thus a part of the contract documents.

1.03 SUBCONTRACTOR. The term "subcontractor", as employed herein, includes only those having a direct contract with the CONTRACTOR for performance of work on the project contemplated by these contract documents. Owner shall have no responsibility to any subcontractor employed by CONTRACTOR for performance of work on the project contemplated by these contract documents, and any such subcontractor shall look exclusively to CONTRACTOR for any payments due subcontractor.

1.04 WRITTEN NOTICE. Written Notice shall be deemed to have been duly served if 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 if delivered at or sent by Certified Mail, Return Receipt Requested, to the last known business address or registered office of such individual, firm or corporation.

1.05 WORK. Unless otherwise stipulated, the CONTRACTOR shall provide and pay for all materials, supplies, machinery, equipment, tools, superintendence, labor, services, insurance, and all water, light, power, fuel, transportation and all other facilities or services of any nature whatsoever necessary for the execution and completion of the work covered by the contract documents. Unless otherwise specified, all materials shall be new, and both workmanship and materials shall be of good quality. The Contractor shall, if required by the ENGINEER as representative of the Owner, furnish satisfactory evidence as to the kind and quality of materials.

Materials or work described in words which so applied have well-known, technical or trade meaning shall be held to refer to such recognized standards. All work shall be done and all materials shall be furnished in strict conformity with the contract documents.

1.06 EXTRA WORK. The term "Extra Work", as used in this Contract, shall be understood to mean and include all work that may be required by the ENGINEER as representative of the Owner, to be done by the CONTRACTOR to accomplish any change, alteration or addition to the work shown upon the plans or reasonably implied by the specifications, and which shall, prior to the commencement of such work, be authorized in writing by the ENGINEER.

1.07 WORKING DAY. A "working day" is defined as any day not including Saturdays, Sundays or any legal holidays, in which weather or other conditions not under the control of the CONTRACTOR, will permit construction of the principal units of the work for a period of not less than seven (7) hours between 7:00 a.m. and 6:00 p.m.

1.08 CALENDAR DAY. A "calendar day" is any day of the week or month, no days being excepted.

1.09 INTERPRETATION OF WORDS AND PHRASES. Whenever the words “directed”, “permitted”, “designated”, “required”, “considered necessary”, “prescribed” or words of like import are used, it shall be understood that the direction, requirement, permission, order, designation or prescription of the ENGINEER as the Owner’s representative is intended. Similarly, the words “approved”, “acceptable”, “satisfactory” or words of like import shall mean that no exception is taken, but does not relieve CONTRACTOR of responsibility for performance of project requirements.

Whenever in the Specifications or drawings accompanying this Agreement, the terms of description of various qualities relative to finish, workmanship or other qualities of similar kind which cannot, from their nature, be specifically and clearly described and specified, but are necessarily described in general terms, the fulfillment of which must depend on individual judgment, then, in all such cases, any question of the fulfillment of said Specifications shall be decided by the ENGINEER as the Owner’s representative, and said work shall be done in accordance with his interpretations of the meaning of the words, terms or clauses defining the character of the work.

1.10 SPECIAL CONDITIONS. In the event special conditions are contained herein as part of the contract documents and said special conditions conflict with any of the general conditions contained in this Contract, then in such event the special conditions shall control.

2. RIGHTS AND RESPONSIBILITIES OF THE OWNER

2.01 ADEQUACY OF DESIGN. It is understood that the Owner believes it has employed competent Engineers and/or designers. It is, therefore, agreed that the Owner shall be responsible for the adequacy of the design, sufficiency of the contract documents, the safety of the structure and the practicability of the operations of the completed project, provided that the CONTRACTOR has complied with the requirements of the said contract documents, all approved modifications thereof and additions and alterations thereto approved in writing by the Owner. The burden of proof of such compliance shall be upon the CONTRACTOR to show that he has complied with the requirements

of the contract documents and approved modifications thereof and all approved additions and alterations, thereto, as the same shall have been interpreted by the ENGINEER.

2.02 RIGHT OF ENTRY. The Owner reserves the right to enter the property or location on which the work herein contracted for is to be constructed or installed, for itself or such agent or agents as it may select, for the purpose of inspecting the work, or for the purpose of constructing or installing such collateral work as the Owner may desire. The Owner shall have the right to make inspections at all reasonable times, and the CONTRACTOR shall have no cause to complain if his work shall be delayed by reason of such inspection, construction or installation of collateral work.

2.03 OWNERSHIP OF DRAWINGS. All drawings, specifications and copies thereof furnished by the ENGINEER shall not be reused on other work and, with the exception of the sets forming the part of the signed contract documents, are to be returned to the ENGINEER on request at the completion of the work. All models are the property of the Owner.

2.04 CHANGES AND ALTERATIONS. The CONTRACTOR further agrees that the Owner may make such changes and alterations as the Owner may see fit, in the line, grade, form, dimensions, plans or materials for the work herein contemplated, or any part thereof, either before or after the beginning of construction, without affecting the validity of this Contract and the accompanying Performance and Payment Bonds.

If such changes or alterations diminish the quantity of the work to be done, they shall not constitute the basis for a claim for damages or anticipated profits on the work that may be dispensed with. If the amount of work is increased and the work can fairly be classified under the specifications, such increase shall be paid for according to the quantity actually done and at the unit price, if any, established for such work under this Contract, except as hereinafter provided for unit price items under Article 6 of this Contract; otherwise, such additional work shall be paid for as provided under Article 7 hereof for Extra Work. In case the Owner shall make such changes or alterations as shall make useless any work already done or material already furnished or used in said work, then the Owner shall compensate the CONTRACTOR for any material or labor so used and for any actual loss occasioned by such change due to actual expenses incurred in preparation for the work as originally planned.

2.05 DAMAGES. In the event the CONTRACTOR is damaged in the course of the completion of the work by the act, negligence, omission, mistake or default of the Owner or of the ENGINEER or of any other CONTRACTOR employed by the Owner upon the work, thereby causing loss to the CONTRACTOR, the Owner agrees that he will reimburse the CONTRACTOR for such loss. In the event the Owner is damaged in the course of the work by the act, negligence, omission, mistake or default of the CONTRACTOR, or should the CONTRACTOR unreasonably delay the progress of the work being done by others on the job so as to cause loss for which the Owner becomes liable, then the CONTRACTOR shall reimburse the Owner for such loss.

3. RIGHTS AND RESPONSIBILITIES OF THE ENGINEER

3.01 OWNER-ENGINEER RELATIONSHIP. The ENGINEER shall serve as the Owner's representative during construction. The duties, responsibilities and limitations on the authority of the ENGINEER as the Owner's representative during construction are set forth in the contract documents; and the ENGINEER shall not have authority to extend the Owner's liability or to bind the Owner for any additional liability of any nature whatsoever without the written consent of the Owner. The ENGINEER shall constantly advise the Owner as to the progress of the work, and any instructions by the Owner to the CONTRACTOR shall be issued through the ENGINEER.

It is the intent of this Agreement that there shall be no delay in the execution of the work; therefore, written decisions or directions rendered by the ENGINEER as the Owner’s representative shall be promptly carried out, and any claim arising therefrom shall be adjusted as hereinafter provided. Unless otherwise specified, it is mutually agreed between the parties to this Agreement that the ENGINEER shall review all work included herein and shall have the authority to issue written stop work orders whenever such stoppage may be necessary to insure the proper execution of this Contract.

3.02 KEEPING OF PLANS AND SPECIFICATIONS ACCESSIBLE. The ENGINEER shall furnish the CONTRACTOR three (3) sets of Plans and Specifications without expense to the CONTRACTOR, and the CONTRACTOR shall keep one copy of the same constantly accessible on the job site, with the latest revisions noted thereon. Additional sets can be provided to the CONTRACTOR at his request for the fee set in the Notice to Bidders. The CONTRACTOR shall be responsible for preserving the Plans and Specifications for reference and review by the Owner or the ENGINEER.

3.03 PRELIMINARY APPROVAL. The ENGINEER shall not have the power to waive the obligations imposed under this Contract for the furnishing by the CONTRACTOR of good material, and for performing good work as herein described, and in full accordance with the Plans and Specifications, without alteration, deletion or change. No failure or omission of the ENGINEER to discover, object to or condemn any defective work or material shall release the CONTRACTOR from the obligation to fully and properly perform the Contract, including without limitation, the obligation to at once tear out, remove and properly replace any defective work or material at any time prior to final acceptance, upon discovery of such defective work or material; provided, however, that the ENGINEER shall, upon request of the CONTRACTOR, inspect and accept or reject any material furnished, and in the event the material has been once accepted by the ENGINEER, such acceptance shall be binding on the Owner, unless it can be clearly shown that such material furnished does not meet the specifications for this work.

Any questioned work may be ordered taken up or removed for re-examination by the ENGINEER prior to final acceptance, and if found not to be in accordance with the specifications for said work, all expense of removing, re-examination and replacement shall be borne by the CONTRACTOR; otherwise the expense thus incurred shall be allowed as Extra Work and shall be paid for by the Owner, provided that where inspection or approval is specifically required by the Specifications prior to performance of certain work, should the CONTRACTOR proceed with such work without requesting prior inspection or approval, he shall bear all expense of taking up, removing and replacing this work if so directed by the ENGINEER.

3.04 OBSERVATIONS BY ENGINEER. The ENGINEER shall make periodic visits to the site to observe the progress and quality of the executed work and to determine if such work generally meets the essential performance and design features and the technical, functional and/or Professional requirements of the contract documents, and is in all other respects being performed in compliance with the contract documents. However, the ENGINEER shall not be responsible for making any detailed, exhaustive, comprehensive or continuous on-site observations to check the quality and/or quantity of the work, nor shall the ENGINEER be in any way responsible, directly or indirectly, for the construction means, methods, techniques, sequences, quality, procedures, programs, safety precautions or lack of same incident to the work being performed or any part thereof. The ENGINEER shall use reasonable care to prevent deviation from the intent and substance of the contract documents by the CONTRACTOR in the performance of the work and any part thereof and, on the basis of such on-site observations, will keep the Owner informed of the progress of the work and will endeavor to guard the Owner against defects and deficiencies in the work of the CONTRACTOR. Notwithstanding any other provision of this Agreement or any other contract document, the ENGINEER shall not be in any way responsible or liable for any acts, errors, omissions or negligence of the CONTRACTOR, any subcontractors' agents, servants or employees or any other person, firm or corporation performing or attempting to perform any of the work.

3.05 LINES AND GRADES. The CONTRACTOR shall employ a surveyor licensed in the state of Texas to provide all lines, grade and construction staking.

3.06 DETERMINATION OF QUESTIONS AND DISPUTES. In order to prevent delays and disputes and to discourage litigation, it is agreed that the ENGINEER shall, in all cases, determine the amounts and quantities of the several kinds of work which are to be paid for under this Contract. The ENGINEER shall determine all questions in relation to said work and the construction thereof, as well as all claims, disputes and other matters in question between the CONTRACTOR and the Owner relating to the execution or progress of the work or the interpretation of the contract documents. In the event the ENGINEER shall become aware of or shall receive information that there is a dispute or a possible dispute as to the reasonable interpretation of the terms and conditions of the contract documents, or any other dispute, claim or question, the ENGINEER shall, within a reasonable time, provide a written interpretation of the contract documents or a written decision on all claims of the parties hereto and on all questions arising relative to the execution of the work, copies of which shall be delivered to all parties to the Contract, and the original thereof shall become a part of the contract documents and shall be binding and final as to all parties to the Contract.

3.07 OBJECTIONS. In the event the ENGINEER renders any decision which, in the opinion of either the Owner or the CONTRACTOR, is not in accordance with the meaning and intent of this Contract, either party may, within thirty (30) days of receipt of such decision, file its written objection to the decision with the ENGINEER; and the ENGINEER shall, upon receipt of such written objection and within thirty (30) days thereafter, review the same and render a written affirmation or modification of the original interpretation, which shall become a part of the contract documents. Either party who shall remain aggrieved after the ENGINEER has rendered his affirmation or modification of his previous decision, shall have the right, within a period not to exceed sixty (60) days after the ENGINEER has filed his affirmation or modification of the decision with the City Secretary, to file suit in the District Court of Galveston County, seeking a declaratory judgment or other relief to determine the intent of the contract documents. If any aggrieved party

shall fail to file such a petition with the District Court within the time specified, the decision of the ENGINEER shall become final and binding and non-appealable.

3.08 RECOMMENDATION OF PAYMENT. The ENGINEER shall review the CONTRACTOR's application for payment and supporting documents, shall determine the amount owed to the CONTRACTOR and shall provide written recommendation to the Owner for payment to the CONTRACTOR in such amount. Such recommendation of payment to CONTRACTOR shall constitute a representation to the Owner of the ENGINEER's judgment that the work has progressed to the point indicated, to the best of his knowledge, information and belief; however, such recommendation of an application for payment to CONTRACTOR shall not be deemed to be a representation by the ENGINEER that any examination has been made to determine how or for what purpose CONTRACTOR has used the monies paid on account of the contract price. As a condition of final payment, the CONTRACTOR shall execute an Agreement for Final Payment and CONTRACTOR's Sworn Release, in a form as included herein and made a part of these contract documents, being its agreement to accept the amount recommended by the ENGINEER as full payment for the work that has been completed as set out in the CONTRACTOR's application for payment and supporting data.

4. RIGHTS AND RESPONSIBILITIES OF THE CONTRACTOR

4.01 INDEPENDENT CONTRACTOR. CONTRACTOR is, and shall remain, an independent CONTRACTOR, solely responsible for the manner and method of completing the work under this Contract, with full and exclusive power and authority to direct, supervise and control his own employees and to determine the means, method and manner of performing such work, so long as such methods do not adversely affect the completed improvements or any other property abutting or adjoining the work area, the Owner and ENGINEER being interested only in the result obtained and conformity of such completed improvements to the Plans, Specifications and Contract. The fact that the Owner or ENGINEER as the Owner's representative shall have the right to observe CONTRACTOR's work during his performance and to carry out the other prerogatives which are expressly reserved to and vested in the Owner and the ENGINEER hereunder, is not intended to and shall not at any time change or affect the status of the CONTRACTOR as an independent CONTRACTOR with respect to either the Owner or the ENGINEER as the Owner's representative or to the CONTRACTOR's own employees or to any other person, firm or corporation.

4.02 CONTRACTOR'S UNDERSTANDING. It is understood and agreed that the CONTRACTOR has, by careful examination, satisfied himself as to the nature and location of the work, the conformation of the ground, the character, quality and quantity of the materials to be encountered, the character of equipment and facilities needed preliminary to and during the prosecution of the work, the general and local conditions, and all other matters which in any way affect the work under this Contract. It is further understood that the CONTRACTOR has satisfied himself as to the terms, meaning and intent of all of the contract documents and understands the meanings of all parts of such documents or other factors affecting the work, which were not previously understood. No verbal agreement or conversation with any officer, agent or employee of the Owner or the ENGINEER, either before or after the execution of this Contract, shall affect or modify any of the terms or obligations herein contained.

4.03 LAWS AND ORDINANCES. The CONTRACTOR shall at all times observe and comply with all federal, state or local laws, ordinances and regulations, regardless of whether the

same are adopted before or after the execution of this Contract, which in any manner affect the Contract or the work, and shall indemnify, save and hold harmless the Owner and the ENGINEER against any claim arising out of the violation of any such laws, ordinances and regulations, whether by the CONTRACTOR or his employees. If the CONTRACTOR observes that the Plans and Specifications are at variance with federal or state laws or the ordinances or regulations of the City, he shall promptly notify the ENGINEER in writing, and any necessary changes shall be made as provided in the Contract for changes in the work. If the CONTRACTOR performs any work knowing it to be contrary to such laws, ordinances, rules and regulations, and without such notice to the ENGINEER, he shall bear all costs arising therefrom.

The Owner is a municipal corporation of the State of Texas, and the law from which it derives its powers, insofar as the same regulates the objects for which, or the manner in which, or the conditions under which the Owner may enter into contracts, shall be controlling and shall be considered as part of this Contract to the same effect as though embodied herein. The Code of Ordinances of the City and other applicable regulations of the OWNER shall be deemed to be embodied in this Contract.

4.04 ASSIGNMENT AND SUBLETTING. The CONTRACTOR further agrees that he will retain personal control and will give his personal attention to the fulfillment of this Contract and that he will not assign, by power of attorney or otherwise, or sublet said Contract without the written consent of the ENGINEER, and that no part or feature of the work will be sublet to anyone objectionable to the ENGINEER or the Owner. In addition, the Owner reserves the right to disapprove the subletting of this Contract or any portion hereof on any basis whatsoever. The CONTRACTOR further agrees that the subletting of any portion or feature of the work or materials required in the performance of this Contract shall not relieve the CONTRACTOR from his obligations to the Owner, as provided for by this Agreement.

4.05 PERFORMANCE AND PAYMENT BONDS. In the event the contract price shall be in excess of $25,000.00, the CONTRACTOR shall execute separate Performance and Payment Bonds, each in the sum of one hundred percent (100%) of the total contract price, which shall be increased at any time to cover any change orders, additives or add-ons, in accordance with Chapter 2253, Texas Government Code, as amended. If the contract price does not exceed $25,000.00, the statutory bonds will not be required. All required bonds shall be submitted on forms supplied by the Owner for this purpose, guaranteeing the faithful performance of the work and fulfillment of any guarantees required, and further guaranteeing payment to all persons supplying labor and materials or furnishing him any equipment in the execution of the Contract. It is agreed that the Contract shall not be in effect until such Performance and Payment Bonds are furnished and approved by the Owner.

Each such bond shall be executed by a corporate surety or corporate sureties duly authorized to do business in the State of Texas. The cost of the premium for the Performance and Payment Bonds shall be included in the CONTRACTOR's Proposal.

4.06 INSURANCE. Minimum insurance requirements for CONTRACTOR awarded this Contract shall be as follows:

(1.) Worker's Compensation. Worker’s Compensation Insurance as defined by the Texas Worker’s Compensation Act.

A. **Definitions:**

Certificate of coverage ("certificate") - A copy of a certificate of insurance, a certificate of authority to self-insure issued by the commission, or a coverage agreement (TWCC-81, TWCC-82, TWCC-83, or TWCC-84), showing statutory worker's compensation insurance coverage for the person's or entity's employees providing services on a project, for the duration of the project.

Duration of the project - includes the time from the beginning of the work on the project until the CONTRACTOR's/person's work on the project has been completed and accepted by the City of League City.

Persons providing services on the project ("subcontractor" in §406.096) - includes all persons or entities performing all or part of the services the CONTRACTOR has undertaken to perform on the project, regardless of whether that person contracted directly with the CONTRACTOR and regardless of whether that person has employees. This includes, without limitation, independent CONTRACTORs, subcontractors, leasing companies, motor carriers, owner-operators, employees of any such entity, or employees of any entity which furnishes persons to provide services on the project. "Services" include, without limitation, providing, hauling, or delivering equipment or materials, or providing labor, transportation, or other service related to a project. "Services" does not include activities unrelated to the project, such as food/beverage vendors, office supply deliveries and delivery of portable toilets.

B. The CONTRACTOR shall provide coverage, based on proper reporting of classification codes and payroll amounts and filing of any coverage agreements, which meets the statutory requirements of Texas Labor Code, Section 401.01(44) for all employees of the CONTRACTOR providing services on the project, for the duration of the project.

C. The CONTRACTOR must provide a certificate of coverage to the City of League City prior to being awarded the contract.

D. If the coverage period shown on the CONTRACTOR's current certificate of coverage ends during the duration of the project, the CONTRACTOR must, prior to the end of the coverage period, file a new certificate of coverage with the City of League City showing that coverage has been extended.

E. The CONTRACTOR shall obtain from each person providing services on a project, and provide to the City of League City:

(1.) A certificate of coverage, prior to that person beginning work on the project, so that the City of League City will have on file certificates of coverage showing coverage for all persons providing services on the project; and

(2.) No later than seven days after receipt by the CONTRACTOR, a new certificate of coverage showing extension of coverage, if the coverage period shown on the current certificate of coverage ends during the duration of the project.

F. The CONTRACTOR shall retain all required certificates of coverage for the duration of the project and for one year thereafter.

G. The CONTRACTOR shall notify the City of League City in writing by certified mail or personal delivery, within 10 days after the CONTRACTOR knew or should have known, of any change that materially affects the provision of coverage of any person providing services on the project.

H. The CONTRACTOR shall post on each project site a notice, in the text, form and manner prescribed by the Texas Worker's Compensation Commission, informing all persons providing services on the project that they are required to be covered, and stating how a person may verify coverage and report lack of coverage.

I. The CONTRACTOR shall contractually require each person with whom it contracts to provide services on a project to:

(1.) Provide coverage, based on proper reporting of classification codes and payroll amounts and filing of any coverage agreements, which meets the statutory requirements of Texas Labor Code, Section 401.011(44) for all of its employees providing services on the project, for the duration of the project.

(2.) Provide to the CONTRACTOR, prior to that person beginning work on the project, a certificate of coverage showing that coverage is being provided for all employees of the person providing services on the project, for the duration of the project.

(3.) Provide the CONTRACTOR, prior to the end of the coverage period, a new certificate of coverage showing extension of coverage, if the coverage period shown on the current certificate of coverage ends during the duration of the project.

(4.) Obtain from each other person with whom it contracts, and provide to the CONTRACTOR:

a. A certificate of coverage, prior to the other person beginning work on the project; and
b. A new certificate of coverage showing extension of coverage, prior to the end of the coverage period, if the coverage period shown on the current certificate of coverage ends during the duration of the project;

(5.) Retain all required certificates of coverage on file for the duration of the project and for one year thereafter;

(6.) Notify the City of League City in writing by certified mail or personal delivery, within 10 days after the person knew or should have known, or any change that materially affects the provision of coverage of any person providing services on the project; and

(7.) Contractually require each person with whom it contracts, to perform as required by paragraphs (1) - (7), with the certificates of coverage to be provided to the person for whom they are providing services.

J. CONTRACTOR shall provide a waiver of subrogation in the name of the City of League City.

K. By signing this contract or providing or causing to be provided a certificate of coverage, the CONTRACTOR is representing to the City of League City that all employees of the CONTRACTOR who will provide services on the project will be covered by worker's compensation coverage for the duration of the project, that the coverage will be based on proper reporting of classification codes and payroll amounts, and that all coverage agreements will be filed with the appropriate insurance carrier or, in the case of self-insured, with the commission's Division of Self-Insurance Regulation. Providing false or misleading information may subject the CONTRACTOR to administrative penalties, criminal penalties, civil penalties, or other civil actions.

L. The CONTRACTOR's failure to comply with any of these provisions is a breach of contract by the CONTRACTOR which entitles the City of League City to declare the contract void if the CONTRACTOR does not remedy the breach within ten days after receipt of notice of breach from the City of League City.

(2.) Comprehensive General Liability: Comprehensive General Liability (including Premises/Operations; Independent CONTRACTORs; Products and Completed Operations; Broad Form Property Damage; Blanket Contractual):

A. Bodily Injury and Property Damage:

General Aggregate Limits:	$1,000,000
Products/Completed Operations Aggregate Limits:	$1,000,000

(3.) Business Automobile Liability: Business Automobile Liability (including non-owned and lease vehicles):

A.	Bodily Injury: Each Person	$1,000,000
B.	Property Damage: Each Accident	$1,000,000

(4.) Contractual Endorsement: The Contractual Liability shall provide coverage for not less than the following amounts:

A.	Bodily Injury: Each Occurrence	$1,000,000
B.	Property Damage: Each Occurrence	$1,000,000

(5.) OWNER's Insurance: CONTRACTOR shall provide insurance for the Owner as follows:

A. The City of League City, the ENGINEER, their agents and employees shall be named as an Additional Insured under the General Liability and Automobile Policies. A copy of the endorsements shall be furnished to the City.

(6.) Property Insurance: As Indicated.

(7.) Umbrella Liability Policy: CONTRACTOR shall purchase and maintain Excess and Liability Insurance *Umbrella) in a form following the underwritten coverage in an amount of $2,000,000 each occurrence and $2,000,000 aggregate.

(8.) Settlement of Insurance Claims: Losses insured under policies that include Owner as a named insured shall be adjusted with Owner and made payable to Owner as trustee for the insured, as their interests may appear.

(9.) The Owner, the ENGINEER, their agents and employees, must be named as one of the insured in each of the above coverages.

(10.) The usual ten-day cancellation notice clause may be inserted in all coverages where appropriate and customary.

(11.) All coverages must be with companies acceptable to the Owner. The CONTRACTOR will furnish the Owner with a copy of each insurance policy required in connection with this work if requested by the Owner.

In the event the CONTRACTOR shall fail to provide insurance as herein required, or be subject to claim, demand or litigation growing out of or arising from a claim not contemplated herein, such failure on the part of the CONTRACTOR shall not serve to release or in any way discharge or shift the liability of the CONTRACTOR to the ENGINEER or Owner; but the CONTRACTOR does herein agree to indemnify and hold the ENGINEER and Owner harmless from any and all claims growing out of or arising by reason of any of the circumstances herein enumerated, or any other claims or demands made by any person, growing out of or arising by reason of the work performed by the CONTRACTOR.

The CONTRACTOR shall defend, indemnify and hold harmless the Owner and the ENGINEER and their respective officers, agents and employees, from and against all damages, claims, losses, demands, suits, judgments and costs, including reasonable attorney's fees and

expenses, arising out of or resulting from the performance of the work, provided that any such damages, claim, loss, demand, suit, judgment, cost or expense:

(1.) Is attributable to bodily injury, sickness, disease or death to or injury to or destruction of tangible property (other than the work itself) including the loss of use resulting therefrom; and,

(2.) Is caused in whole or in part by any negligent act or omission of the CONTRACTOR, any subcontractor, anyone directly or indirectly employed by any one of them or anyone for whose acts any of them may be liable, regardless of whether or not it is caused in part by a party indemnified hereunder.

4.07 PERMITS AND FEES. Unless otherwise provided in the Contract Documents, the CONTRACTOR shall secure and pay for all construction permits, licenses, and other inspections necessary for proper execution and completion of the Work and which are legally required at the time bids are received.

4.08 TEXAS STATE SALES TAX. Materials incorporated into this project are exempt from State Sales Tax according to provisions of the Texas Tax Code, Chapter 151, Subsection H.

The CONTRACTOR must obtain a limited sales, excise and use tax permit or exemption certificate which shall enable him to buy the materials to be incorporated into the work without paying the tax at the time of purchase.

4.09 CONTRACTOR'S DUTY AND SUPERINTENDENCE. The CONTRACTOR shall give adequate attention to the faithful prosecution and completion of this Contract and shall keep on the work, during its progress, a competent superintendent and any necessary assistants, all satisfactory to the ENGINEER as the Owner's representative. The superintendent shall represent the CONTRACTOR in his absence and shall act as the employee or agent of the CONTRACTOR, and all directions given to him shall be binding as if given to the CONTRACTOR. Adequate supervision by competent and reasonable representatives of the CONTRACTOR is essential to the proper performance of the work, and lack of such supervision shall be grounds for suspending operations of the CONTRACTOR.

The work, from its commencement to completion, shall be under the exclusive charge and control of the CONTRACTOR, and all risk in connection therewith shall be borne by the CONTRACTOR. Neither the Owner nor the ENGINEER as the Owner's representative will be responsible for the acts or omissions of the CONTRACTOR, its subcontractors or any of its agents or employees, or any other persons performing any of the work.

4.10 CHARACTER OF WORKERS. The CONTRACTOR agrees to employ only orderly and competent workers, skillful in the performance of the type of work required under this Contract, to do the work, and agrees that whenever the ENGINEER shall inform him in writing that any worker or workers on the work are, in his opinion, incompetent, unfaithful or disorderly, or in the ENGINEER's opinion, are not using their best efforts for the progress of the work, such worker or workers shall be discharged from the work and shall not again be employed on the work without the ENGINEER's written consent.

4.11 LABOR, EQUIPMENT, MATERIALS, CONSTRUCTION PLANT AND BUILDINGS. The CONTRACTOR shall provide all labor, tools, equipment, machinery and materials necessary in the prosecution and completion of this Contract where it is not otherwise specifically provided that the Owner shall furnish the same; and further, the CONTRACTOR shall be responsible for the care, preservation, conservation and protection of all materials, supplies, machinery, equipment, tools, apparatus, accessories, facilities, all means of construction and any and all parts of the work, whether the CONTRACTOR has been paid, partially paid or not paid for such work, until the entire work is completed and accepted.

Temporary buildings, structures for housing workers, or the erection of tents or other forms of protection, or structures for the use of the CONTRACTOR will be permitted only at such places as the ENGINEER shall direct, and the sanitary conditions of the grounds in or about such structures shall at all times be maintained in a manner satisfactory to the ENGINEER. Any structures of any nature constructed or erected by the CONTRACTOR for the purposes herein set out, shall be the sole responsibility of the CONTRACTOR as to the proper erection or construction thereof; and the CONTRACTOR agrees to indemnify and hold the ENGINEER or Owner harmless from any claims of any nature whatsoever brought against either of them for damages allegedly sustained by anyone by reason of the erection, construction or maintenance of CONTRACTOR's buildings.

4.12 SANITATION. Necessary sanitary conveniences for the use of laborers on the work site, properly secluded from public observation, shall be constructed and maintained by the CONTRACTOR in such manner and at such points and shall be approved by the ENGINEER, and their use shall be strictly enforced. Any structures of any nature constructed or erected by the CONTRACTOR for the purposes herein set out, shall be the sole responsibility of the CONTRACTOR as to the proper erection or construction thereof, and the CONTRACTOR agrees to indemnify and hold the ENGINEER or Owner harmless from any claims of any nature whatsoever brought against either of them for damages allegedly sustained by anyone by reason of the erection, construction or maintenance of CONTRACTOR's buildings.

4.13 CLEANING AND MAINTENANCE. The CONTRACTOR shall at all times keep and maintain the premises free from accumulation of debris caused by the work, and at the completion of the work, he shall remove all such debris and also his tools, scaffolding and surplus materials and shall leave the work broom-clean or its equivalent. The work shall be left in good order and condition. In case of dispute, the Owner may remove the debris and charge the cost to the CONTRACTOR.

4.14 PERFORMANCE OF WORK. It is further agreed that it is the intent of this Contract that all work must be done and all material must be furnished in accordance with the generally accepted practice for such materials furnished or work completed.

4.15 RIGHT OF OWNER TO MODIFY METHODS AND EQUIPMENT. If at any time the methods or equipment used by the CONTRACTOR are found to be inadequate to secure the quality of work with the rate of progress required under this Contract, the Owner or the ENGINEER as the Owner's representative may order the CONTRACTOR in writing to increase their safety or improve their character and efficiency, and the CONTRACTOR shall comply with such order.

If at any time the working force of the CONTRACTOR is inadequate for securing the progress herein specified, the CONTRACTOR shall, if so ordered in writing, increase his force or

equipment, or both, to such an extent as to give reasonable assurance of compliance with the schedule of progress.

4.16 LAYOUT OF WORK. Except as specifically provided herein, the CONTRACTOR shall be responsible for laying out all work and shall accomplish this work in a manner acceptable to the ENGINEER.

4.17 SHOP DRAWINGS. The CONTRACTOR shall submit to the ENGINEER, with such promptness as to cause no delay in his own work or in that of any other CONTRACTOR, six (6) checked copies, unless otherwise specified, of all shop and/or setting drawings and schedules required for the work of the various trades. CONTRACTOR will check and approve shop drawings for compliance with requirements of Contract and will so certify by stamp on each drawing prior to submittal to ENGINEER. Any drawings submitted without CONTRACTOR's stamp of approval will not be considered and will be returned to him for proper submission. The ENGINEER shall pass upon them with reasonable promptness, making desired correction. The CONTRACTOR shall make any corrections required by the ENGINEER, file with him two (2) corrected copies and furnish such other copies as may be needed. The ENGINEER's approval of such drawings or schedules shall not relieve the CONTRACTOR from responsibility for deviations from drawings or specifications, unless he has, in writing, called the ENGINEER's attention to such deviations at the time of the submission, and the ENGINEER has acknowledged such deviations in writing, nor shall it relieve him from responsibility for errors of any sort in shop drawings or schedules. It shall be the CONTRACTOR's responsibility to fully and completely review all shop drawings to ascertain their effect on his ability to perform the required contract work in accordance with the Plans and Specifications and within the contract time.

Such review by the ENGINEER shall be for the sole purpose of determining the sufficiency of said drawings or schedules to result in finished improvements in conformity with the Plans and Specifications, and shall not relieve the CONTRACTOR of his duty as an independent CONTRACTOR as previously set forth, it being expressly understood and agreed that the ENGINEER does not assume any duty to pass upon the propriety or adequacy of such drawings or schedules, or any means or methods reflected thereby, in relation to the safety of either person or property during CONTRACTOR's performance hereunder, and any action taken by the ENGINEER shall not relieve the CONTRACTOR of his responsibility and liability, as set out in the contract documents.

4.18 ENGINEER-CONTRACTOR RELATIONSHIP; OBSERVATIONS. It is agreed by the CONTRACTOR, that the ENGINEER, as the Owner’s representative, and/or the Owner shall be and is authorized to appoint such subordinate Professionals, supervisors or observers as said ENGINEER and/or the Owner may from time to time deem proper to observe the materials furnished and the work done under this Agreement, and to see that said materials is furnished and said work is done in accordance with the specifications. The CONTRACTOR shall furnish all reasonable aid and assistance required by the subordinate Professionals, supervisors or observers for the proper observation and examination of the work. The CONTRACTOR shall regard and obey the directions and instructions of any subordinate Professionals, supervisors or observers so appointed, when such directions and instructions are consistent with the obligations of this Agreement and accompanying Plans and Specifications, provided, however, should the CONTRACTOR object to any orders by any subordinate Professional, supervisor or observer, the CONTRACTOR may, within six (6) days, make written appeal to the ENGINEER for his decision.

4.19 OBSERVATION AND TESTING. The Owner or the ENGINEER as the Owner's representative shall have the right at all reasonable times to observe and test the work. The CONTRACTOR shall make all necessary arrangements and provide proper facilities and access for such observation and testing at any location wherever work is in preparation or progress. The CONTRACTOR shall ascertain the scope of any observation which may be contemplated by the Owner or the ENGINEER and shall give ample notice as to the time each part of the work will be ready for such observation. The Owner or the ENGINEER may reject any work found to be defective or not in accordance with the contract documents, regardless of the stage of its completion or the time or place of discovery of such errors, and regardless of whether the ENGINEER has previously accepted the work through oversight or otherwise. If any work is covered without approval or consent of the Owner, it must, if requested by the Owner or the ENGINEER, be uncovered for examination, at the sole expense of the CONTRACTOR. In the event that any part of the work is being fabricated or manufactured at a location where it is not convenient for the Owner or the ENGINEER to make observations of such work or require testing of said work, then in such event, the Owner or the ENGINEER may require the CONTRACTOR to furnish the Owner or the ENGINEER with certificates of inspection, testing or approval made by persons competent to perform such tasks at the location where that part of the work is being manufactured or fabricated. All such tests will be in accordance with the methods prescribed by the American Society for Testing and Materials or such other applicable organization as may be required by law or the contract documents.

If any work which is required to be observed, tested or approved is covered up without written approval or consent of the Owner or the ENGINEER, it must, if requested by the Owner or the ENGINEER, be uncovered for observation and testing, at the sole expense of the CONTRACTOR. The cost of all such inspections, tests and approvals shall be borne by the CONTRACTOR unless otherwise provided herein. Any work which fails to meet the requirements of such tests, inspections or approval, and any work which meets the requirements of any such tests or approval but does not meet the requirements of the contract documents shall be considered defective. Such defective work shall be corrected at the CONTRACTOR's expense.

Neither observations by the Owner or by the ENGINEER, nor inspections, tests or approvals made by the Owner, the ENGINEER or other persons authorized under this Agreement to make such inspections, tests or approvals, shall relieve the CONTRACTOR from his obligation to perform the work in accordance with the requirements of the contract documents.

4.20 DEFECTS AND THEIR REMEDIES. It is further agreed that if the work or any part thereof, or any material brought on the site of the work for use in the work or selected for the same, shall be deemed by the ENGINEER as unsuitable or not in conformity with the Plans and Specifications, the CONTRACTOR shall, after receipt of written notice thereof from the ENGINEER, forthwith remove such material and rebuild or otherwise remedy such work so that it shall be in full accordance with this Contract. It is further agreed that any such remedial action contemplated herein shall be at CONTRACTOR's expense.

4.21 LIABILITY FOR PROPER PERFORMANCE. Professional construction drawings and specifications, as well as any additional instructions and information concerning the work to be performed, passing from or through the ENGINEER, shall not be interpreted as requiring or allowing the CONTRACTOR to deviate from the Plans and Specifications contained as a part of the contract documents, the intent of such drawings, specifications and any other such instructions being

to define with particularity the agreement of the parties as to the work the CONTRACTOR is to perform. CONTRACTOR shall be fully and completely liable and contractually bound, at his own expense, for design, construction, installation and use or non-use of all items and methods instant to the performance of the Contract, including, without limitation, the adequacy of all temporary supports, shoring, bracing, scaffolding, machinery or equipment, safety precautions or devices, similar items or devices used by him during construction, and work performed either directly or incident to construction, and for all loss, damage or injury incident thereto, either to person or property, whether such damage be suffered by the ENGINEER, the Owner or any other person not a party to this Contract.

Any review of work in progress or any visit or observation during construction, or any clarification of Plans and Specifications by the ENGINEER or Owner, or any agent, employee or representative of either of them, whether through personal observation on the project site or by means of approval of shop drawings for construction or construction processes, or by other means or methods, is agreed by the CONTRACTOR to be for the purpose of observing the extent and nature of work completed or being performed, as measured against the drawings and specifications which are part of the Contract, or for the purpose of enabling the CONTRACTOR to more fully understand the Plans and Specifications so that the completed construction work will conform thereto, and shall in no way relieve the CONTRACTOR from full and complete responsibility for proper performance of his work on the project, including, without limitation, the propriety of means and methods of the CONTRACTOR in performing said Contract, and the adequacy of any designs, plans or other facilities for accomplishing such performance. Any action by the ENGINEER or the Owner in visiting or observing during construction, or any clarification of Plans and Specifications shall not constitute a waiver of CONTRACTOR's liability for damages as herein set out. Deviation by the CONTRACTOR from Plans and Specifications, whether called to the CONTRACTOR's attention or not, shall in no way relieve CONTRACTOR from his responsibility to complete all work in accordance with said Plans and Specifications, and further shall not relieve CONTRACTOR of his liability for loss, damage or injury as herein set out.

4.22 PROTECTION AGAINST ACCIDENT TO EMPLOYEES AND THE PUBLIC. The CONTRACTOR shall take out and procure a policy or policies of Worker’s Compensation Insurance with an insurance company licensed to transact business in the State of Texas, which policy shall comply with the Worker’s Compensation laws of the State of Texas. The CONTRACTOR shall at all times exercise reasonable precautions for the safety of employees and others on or near the work and shall comply with all applicable provisions of federal, state and municipal laws and building and construction codes. All machinery and equipment and other physical hazards shall be guarded in accordance with the "Manual of Accident Prevention in Construction" of the Associated General CONTRACTORs of America, except where incompatible with federal, state or municipal laws or regulations. The CONTRACTOR shall provide such machinery guards, safe walkways, ladders, bridges, gangplanks and other safety devices.

The safety precautions actually taken and their adequacy shall be the sole responsibility of the CONTRACTOR, in his sole discretion as an independent CONTRACTOR. Inclusion of this paragraph in the Agreement, as well as any notice which may be given by the Owner or the ENGINEER as the Owner’s representative concerning omissions under this paragraph as the work progresses, are intended as reminders to the CONTRACTOR of his duty and shall not be construed as any assumption of duty to supervise safety precautions by either the CONTRACTOR or any of his subcontractors.

4.23 PROTECTION OF ADJOINING PROPERTY. The CONTRACTOR shall employ proper means to protect the adjacent or adjoining property or properties in any way encountered, which might be injured or seriously affected by any process of construction to be undertaken under this Agreement, from any damage or injury by reason of said process of construction; and he shall be liable for any and all claims for such damage on account of his failure to fully protect all adjoining property. **THE CONTRACTOR AGREES TO INDEMNIFY, SAVE AND HOLD THE OWNER AND ENGINEER AGAINST ANY CLAIM OR CLAIMS FOR DAMAGES DUE TO ANY INJURY TO ANY ADJACENT OR ADJOINING PROPERTY, ARISING OR GROWING OUT OF THE PERFORMANCE OF THE CONTRACT.**

4.24 PROTECTION AGAINST CLAIMS OF SUBCONTRACTORS, LABORERS, MATERIALMEN AND FURNISHERS OF MACHINERY, EQUIPMENT AND SUPPLIES. **THE CONTRACTOR AGREES THAT HE WILL INDEMNIFY, SAVE AND HOLD THE OWNER AND THE ENGINEER HARMLESS FROM ALL CLAIMS GROWING OUT OF THE LAWFUL DEMANDS OF SUBCONTRACTORS, LABORERS, WORKERS, MECHANICS, MATERIALMEN AND FURNISHERS OF MACHINERY AND PARTS THEREOF, EQUIPMENT, POWER TOOLS AND ALL SUPPLIES, INCLUDING COMMISSARY, INCURRED IN THE FURTHERANCE OF THE PERFORMANCE OF THIS CONTRACT.** When so desired by the Owner, the CONTRACTOR shall furnish satisfactory evidence that all obligations of the nature hereinabove designated have been paid, discharged or waived.

If the CONTRACTOR fails to do so, then the Owner may, at the option of the Owner, either pay directly any unpaid bills of which the Owner has written notice, or withhold from the CONTRACTOR's unpaid compensation a sum of money deemed reasonably sufficient to liquidate any and all such lawful claims until satisfactory evidence is furnished that all liabilities have been fully discharged, whereupon payments to the CONTRACTOR shall be resumed in full, in accordance with the terms of this Contract.

Any and all communications between any parties under this paragraph shall be in writing.

4.25 PROTECTION AGAINST ROYALTIES OR PATENTED INVENTION. The CONTRACTOR shall pay all royalties and license fees and shall provide for the use of any design, device, material or process covered by letters patent or copyright, by suitable legal agreement with the patentee or owner thereof. **THE CONTRACTOR SHALL DEFEND ALL SUITS OR CLAIMS FOR INFRINGEMENT OF ANY PATENT OR COPYRIGHT AND SHALL INDEMNIFY, SAVE AND HOLD THE OWNER AND THE ENGINEER HARMLESS FROM ANY LOSS ON ACCOUNT THEREOF, EXCEPT THAT THE OWNER SHALL DEFEND ALL SUCH SUITS AND CLAIMS AND SHALL BE RESPONSIBLE FOR ALL SUCH LOSS WHEN A PARTICULAR DESIGN, DEVICE, MATERIAL OR PROCESS OR THE PRODUCT OF A PARTICULAR MANUFACTURER OR MANUFACTURERS IS SPECIFIED OR REQUIRED BY THE OWNER; PROVIDED, HOWEVER, IF CHOICE OF ALTERNATE DESIGN, DEVICE, MATERIAL OR PROCESS IS ALLOWED TO THE CONTRACTOR, THEN THE CONTRACTOR SHALL INDEMNIFY, SAVE AND HOLD THE OWNER HARMLESS FROM ANY LOSS ON ACCOUNT THEREOF.** In addition, if the material or process specified or required by the Owner is an infringement, the CONTRACTOR shall be responsible for such loss unless he promptly advises the Owner of such infringement.

4.26 INDEMNIFICATION. The CONTRACTOR shall be solely responsible for the safety of himself, his employees and all other persons, as well as for the protection of the improvements being erected and the property of himself or any other person, as a result of his operations hereunder. **THE CONTRACTOR AGREES TO INDEMNIFY AND HOLD THE ENGINEER AND THE OWNER HARMLESS FROM ANY CLAIMS OR DEMANDS OF ANY NATURE WHATSOEVER MADE BY ANY EMPLOYEE, EMPLOYEES, AGENTS OR SUBCONTRACTORS OF CONTRACTOR, OR BY ANY UNION, TRADE ASSOCIATION, WORKER'S ASSOCIATION OR OTHER GROUPS, ASSOCIATIONS OR INDIVIDUALS, ALLEGEDLY REPRESENTING EMPLOYEES OF THE CONTRACTOR, IN ANY DISPUTE BETWEEN THE CONTRACTOR AND HIS EMPLOYEES, DIRECTLY OR INDIRECTLY INVOLVING, GROWING OUT OF OR ARISING FROM CLAIMS BY SUCH EMPLOYEES FOR WAGES, SALARY, WORKING CONDITIONS OR ANY OTHER COMPLAINT OR CLAIM WHICH MAY BE MADE.**

THE CONTRACTOR, HIS SURETIES AND INSURANCE CARRIERS SHALL DEFEND, INDEMNIFY AND HOLD HARMLESS THE OWNER AND THE ENGINEER AND THEIR RESPECTIVE OFFICERS, AGENTS AND EMPLOYEES FROM AND AGAINST ALL DAMAGES, CLAIMS, LOSSES, DEMANDS, SUITS, JUDGMENTS AND COSTS OF ANY CHARACTER WHATSOEVER, INCLUDING REASONABLE ATTORNEY'S FEES AND EXPENSES, AND SHALL BE REQUIRED TO PAY ANY JUDGMENT THEREFOR, WITH COSTS, WHICH MAY BE OBTAINED AGAINST THE OWNER AND/OR THE ENGINEER OR ANY OF THEIR OFFICERS, AGENTS OR EMPLOYEES, ARISING OUT OF OR RESULTING FROM THE PERFORMANCE OF THE WORK, PROVIDED THAT ANY SUCH DAMAGES, CLAIM, LOSS, DEMAND, SUIT, JUDGMENT, COST OR EXPENSE:

(1) IS ATTRIBUTABLE TO BODILY INJURY, SICKNESS, DISEASE OR DEATH OR INJURY TO OR DESTRUCTION OF TANGIBLE PROPERTY, INCLUDING THE LOSS OF USE RESULTING THEREFROM; AND

(2) IS CAUSED IN WHOLE OR IN PART BY ANY NEGLIGENT ACT OR OMISSION OF THE CONTRACTOR, ANY SUBCONTRACTOR, THEIR AGENTS OR EMPLOYEES OR ANYONE DIRECTLY OR INDIRECTLY EMPLOYED BY ANY ONE OF THEM OR ANYONE FOR WHOSE ACTS ANY OF THEM MAY BE LIABLE, REGARDLESS OF WHETHER OR NOT IT IS CAUSED IN PART BY A PARTY INDEMNIFIED HEREUNDER.

The obligation of the CONTRACTOR under this Agreement shall not extend to the liability of the ENGINEER, his agents or employees, arising out of the preparation or approval of maps, drawings, reports, surveys, designs or specifications, or the giving of or the failure to give directions or instructions by the ENGINEER, his agents or employees, provided such giving or failure to give is the primary cause of the injury or damage.

4.27 LOSSES FROM NATURAL CAUSES. All loss or damage to the CONTRACTOR arising out of the nature of the work to be done or from any unforeseen circumstances in the prosecution of the same, or from the action of the elements, or from unusual obstructions or

difficulties which may be encountered in the prosecution of the work, shall be sustained and borne by the CONTRACTOR at his own cost and expense.

4.28 GUARANTEE. The CONTRACTOR shall furnish the OWNER with a written guarantee on all workmanship and materials provided by him for the project. The written guarantee shall be made out to the OWNER and in a form satisfactory the OWNER's legal counsel, guaranteeing all the work under the Contract to be free from faulty material in every particular and free from improper workmanship; and against unusual damage from proper and usual use; and agreeing to replace or to re-execute without cost to the OWNER such work as may be found to be improper or imperfect, and to require replacement or re-execution. This guarantee shall be made to cover a period of one year from the date of acceptance of work under the Contract, as evidence by the OWNER'S Certificate of Acceptance, of the work. Neither the Certificate of Acceptance, final payment, nor any provision in the Contract Documents shall relieve the CONTRACTOR of the responsibility for neglect or faulty material or workmanship during the period covered by the guarantee. The one year period of any guarantee clauses will not limit the OWNER'S other rights under common law to have defects remedied when discovered after one year.

5. PROSECUTION AND PROGRESS

5.01 TIME AND ORDER OF COMPLETION. It is the meaning and intent of this Contract, unless otherwise herein specifically provided, that the CONTRACTOR shall be allowed to prosecute his work at such times and seasons, in such order of precedence, and in such manner as shall be most conducive to economy of construction; provided, however, that the order and the time of prosecution shall be such that the work shall be completed as a whole, in accordance with this Contract, the Plans and Specifications, and within the time of completion designated in the Proposal; provided, also, that when the Owner is having other work done, either by contract or by his own force, the ENGINEER may direct the time and manner of constructing the work done under this Contract, so that conflict will be avoided and the construction of the various works being done for the Owner shall be harmonized.

The CONTRACTOR shall submit, at such times as may reasonably be requested by the ENGINEER, schedules which shall show the order in which the CONTRACTOR proposes to carry on the work, with dates on which the CONTRACTOR will start the several parts of the work, and estimated dates of completion of the several parts.

5.02 EXTENSION OF TIME. The CONTRACTOR agrees that he has submitted his Proposal in full recognition of the time required for the completion of this project, taking into consideration the average climatic range and industrial conditions prevailing in this locality, and has considered the liquidated damage provisions as hereinafter set forth and that he shall not be entitled to, nor will he request, an extension of time on this Contract, except when completion of the work has been delayed by any act or neglect of the Owner, the ENGINEER, or any employee of either, by other CONTRACTORs employed by the Owner, by changes ordered in the work, by strikes, lockouts, fires and unusual delays by common carriers, by unavoidable cause or causes beyond the CONTRACTOR's control, or by any cause which the ENGINEER shall decide justifies the delay. The CONTRACTOR shall give the ENGINEER prompt notice, in writing, of the cause of such delay; and within ten (10) days after receipt of a written request for an extension of time shall from the CONTRACTOR, supported by all requested documentation, the ENGINEER shall submit such written request, together with his written recommendation, to the City Council for

consideration, and the City Council shall grant an extension of time for completing the work, sufficient to compensate for the delay.

5.03 HINDRANCES AND DELAYS. In executing the Contract Agreement, the CONTRACTOR agrees that in undertaking to complete the work within the time herein fixed, he has taken into consideration and made allowances for all hindrances and delays incident to such work, whether growing out of delays in securing material or workmen or otherwise. No claim shall be made by the CONTRACTOR for damages resulting from hindrances or delays from any cause during the progress of any portion of the work embraced in this Contract, except where the work is stopped by order of the Owner, or the ENGINEER as the Owner's representative for the Owner's convenience, in which event such expense as in the judgment of the ENGINEER is caused by such stoppage of said work shall be paid by the Owner to the CONTRACTOR.

5.04 LIQUIDATED DAMAGES FOR DELAY. It is understood and agreed that time is of the essence in this Contract and that the CONTRACTOR will commence said work on the date specified and will complete said work within the time specified in the Proposal. It is expressly understood and agreed, by and between the CONTRACTOR and the Owner, that the time for the completion of the work described herein is reasonable time for the completion of the same, taking into consideration the average climatic range and conditions and usual industrial conditions prevailing in this locality. The CONTRACTOR further agrees that a breach of this Contract as to completion on time will cause damage to the Owner and that such damages cannot be accurately measured or that ascertainment will be difficult. Therefore, the parties agree that for each and every calendar day the work or any portion thereof shall remain uncompleted after the expiration of the time limit set in the Contract or as extended by the Owner Council, the CONTRACTOR shall pay, as minimum liquidated damages, and not as a penalty, the amount set out in the proposal.

However, the foregoing agreement as to liquidated damages constitutes only an agreement by the Owner and the CONTRACTOR as to the minimum amount of damages which the Owner will sustain in any event by reason of the CONTRACTOR's failure to complete the work within the specified time. Should the Owner suffer damage over and above the minimum amount specified, by reason of the CONTRACTOR's failure to begin the work when ordered, carry it forward uninterruptedly after beginning, or complete it within the specified time in strict accordance with the Plans and Specifications, the Owner may recover such additional amount.

The Owner shall have the right to deduct and withhold the amount of any and all such damages whether it be the minimum amount stipulated above or otherwise, from any monied owing by it to said CONTRACTOR or the Owner may recover such amount from the CONTRACTOR and the sureties of his bond; all of such remedies shall be cumulative and the Owner shall not be required to elect any one nor be deemed to have made an election by proceeding to enforce any one remedy.

6. MEASUREMENT AND PAYMENT

6.01 DISCREPANCIES AND OMISSIONS. It is agreed that it is the intent of this Contract that all work described in the Proposal, the Plans and Specifications and other contract documents, is to be done for the prices quoted by the CONTRACTOR and that such price shall include all appurtenances necessary to complete the work in accordance with the intent of these contract documents as interpreted by the ENGINEER. If the CONTRACTOR finds any discrepancies or omissions in these Plans, Specifications or contract documents, he should notify the ENGINEER and obtain a clarification before the bids are received, and if no such request is received

by the ENGINEER prior to the opening of bids, then it shall be considered that the CONTRACTOR fully understands the work to be included and has provided sufficient sums in his Proposal to complete the work in accordance with these Plans and Specifications. It is further understood that any request for clarification must be submitted no later than seven (7) days prior to the opening of bids.

6.02 QUANTITIES AND MEASUREMENTS. No extra or customary measurements of any kind will be allowed, but the actual measured and/or computed length, area, solid contents, number and weight only shall be considered, unless otherwise specifically provided.

6.03 ESTIMATED QUANTITIES. This Agreement, including the Specifications, Plans and estimate, is intended to show clearly all work to be done and material to be furnished hereunder. Where the estimated quantities are shown for the various classes of work to be done and material to be furnished under this Contract, they are approximate and are to be used only as a basis for estimating the probable cost of the work and for comparing the proposals offered for the work. It is understood and agreed that the actual amount of work to be done and the materials to be furnished under this Contract may differ somewhat from the estimates and that the items listed or estimated quantities stated shall not give rise to a claim by the CONTRACTOR against the Owner for compensation, unless the work shall have actually been authorized, and performed and material supplied.

Where payment is based on the unit price method, the CONTRACTOR agrees that he will make no claim for damages, anticipated profits or otherwise, on account of any differences which may be found between the quantities of work actually done and the material actually furnished under this Contract and the estimated quantities contemplated and contained in the Proposal.

6.04 PRICE OF WORK. In consideration of the furnishing of all the necessary labor, equipment and material and the completion of all work by the CONTRACTOR, and upon the completion of all work and the delivery of all materials embraced in this Contract in full conformity with the specifications and stipulations herein contained, the Owner agrees to pay to the CONTRACTOR the prices set forth in the Proposal attached hereto, which is made a part of this Contract, for the material actually used and services actually performed; however, the Owner does not assume any obligation to pay for any services or material not actually authorized and used. The CONTRACTOR hereby agrees to receive such prices as payment in full for furnishing all materials and all labor required for the aforesaid work, and for all expenses incurred by him, and for full performance of the work and the whole thereof in the manner and according to this Agreement, the attached Plans and Specifications and contract documents, and the requirements of the ENGINEER.

6.05 PAYMENTS. No payments made or certificates given shall be considered as conclusive evidence of the performance of the Contract, either in whole or in part, nor shall any certificate or payment be considered as acceptance of defective work. CONTRACTOR shall, at any time requested during the progress of the work, furnish the Owner or the ENGINEER with a verifying certificate showing the CONTRACTOR's total outstanding indebtedness in connection with the work. Before final payment is made, the CONTRACTOR shall satisfy the Owner, by affidavit or otherwise, that there are no outstanding liens against Owner's premises by reason of any work under the Contract. Acceptance by CONTRACTOR of final payment of the contract price shall constitute a waiver of all claims against Owner which have not theretofore been timely filed as provided in this Contract.

6.06 PARTIAL PAYMENTS. On or before the tenth day of each month, the CONTRACTOR shall prepare and submit to the ENGINEER, for approval or modification, an application for partial payment, being a statement showing as completely as practicable, the total value of the work done by the CONTRACTOR up to and including the last day of the preceding month. The ENGINEER shall then review such statement and application for partial payment and the progress of the work made by the CONTRACTOR and, if found to be in order, shall prepare a certificate for partial payment and shall deliver his certification for payment to the Owner and the CONTRACTOR. No payment shall be made for materials on hand, unless specifically provided for in the Special Conditions to this Agreement.

The CONTRACTOR shall then, prior to payment by the Owner, certify and attest to the certification that he is in accord with the certification and agrees to accept the amounts set out therein and the total set out therein for the work and for the prices contained in the certification. If the CONTRACTOR does not agree or desires to protest the ENGINEER's certification, the same shall not be certified by the ENGINEER to the Owner for payment until such dispute has been resolved, and the CONTRACTOR agrees that any claim by the CONTRACTOR for additional compensation, of any nature whatsoever, not contained in the ENGINEER's certification, shall be waived, and further contracts and agrees, upon acceptance of the CONTRACTOR's payment, that this shall constitute full and final payment for work performed by the CONTRACTOR contained in the CONTRACTOR's statement which shall be attached to the ENGINEER's certification.

The OWNER shall then pay the CONTRACTOR, within thirty (30) days of receipt of the ENGINEER’s recommendation for payment, the total amount of the ENGINEER’s Certificate of Partial Payment, less ten percent (10%) if the total contract price at time of contact execution is less than four hundred thousand dollars ($400,000.00) and five percent (5%) if the total contract price at time of execution is four hundred thousand ($400,000.00) or more. Such amount shall be retained until final payment, and further less all previous payments and all further sums that may be retained by the OWNER under the terms of this Agreement. It is understood, however, that in case the whole work be near to completion, as certified by the ENGINEER, and some unexpected or unusual delay occurs, through no neglect or fault on the part of the CONTRACTOR, the OWNER may, upon written recommendation of the ENGINEER, pay a reasonable and equitable proportion of the retained percentage to the CONTRACTOR, or the CONTRACTOR, at the OWNER's option, may be relieved of the obligation to fully complete the work, and thereupon, the CONTRACTOR shall receive, at the OWNER's option, payment of the balance due him under the Contract, subject only to the conditions set forth under "6.09 FINAL PAYMENT." The OWNER, at its option and in accordance with State law, may reduce retainage to less than ten percent.

6.07 USE OF COMPLETED PORTIONS. The Owner shall have the right to take possession of and use any completed or partially completed portions of the work, notwithstanding that the time for completing the entire work or such portions may not have expired; but such taking possession and use shall not be deemed an acceptance of any work not completed in accordance with the contract documents. If such prior use increases the cost of or delays the work, the CONTRACTOR shall be entitled to such extra compensation or extension of time, or both, as may be determined in accordance with the provisions of this Agreement.

The CONTRACTOR shall notify the ENGINEER, by letter executed by a duly qualified officer of CONTRACTOR, that in CONTRACTOR's opinion, the Contract is "completed".

6.08 FINAL COMPLETION AND ACCEPTANCE. Within ten (10) days after the CONTRACTOR has given the ENGINEER written notice that the work has been completed, the ENGINEER and the Owner shall inspect the work; and within said time. When the work is found to be completed in accordance with the contract documents, the ENGINEER shall issue to the Owner and the CONTRACTOR his Certificate of Completion. Thereupon, it shall be the duty of the Owner, within ten (10) days, to issue a Certificate of Acceptance of the work to the CONTRACTOR or to advise the CONTRACTOR in writing of the reason for non-acceptance.

6.09 FINAL PAYMENT. Upon the issuance of the CERTIFICATE of Completion and Owner's Certificate of Acceptance, the ENGINEER shall proceed to make final measurements and prepare a final statement of the value of all work performed and materials furnished under the terms of the Agreement and shall present the same to the CONTRACTOR for acceptance. The CONTRACTOR, if he finds such statement to be in order, including all work upon which a claim for payment may be made, shall note his acceptance thereon; and by accepting the same, the CONTRACTOR agrees to release any and all claims of any nature whatsoever against the Owner or the ENGINEER, growing out of or by reason of the performance of the Contract, the construction of the work, for Extra Work, or for any other reason whatsoever, either growing out of the Contract and the documents attached thereto or otherwise. In addition, the CONTRACTOR shall execute a full and final release in a form provided by the Owner, a copy of which is attached to these contract documents and made a part hereof, which shall be presented to the Owner with the ENGINEER's final statement and any Change Orders or additions or deletions therefrom, duly attested by the CONTRACTOR, requesting payment.

The Owner shall pay to the CONTRACTOR, on or after the 30th day and before the 35th day after the date of the Certificate of Completion, the balance due the CONTRACTOR under the terms of the Agreement, provided the CONTRACTOR has duly executed and returned all documents requiring execution or approval as herein provided, or as may be provided by the Owner, and that he has fully performed his contractual obligations under the terms of this Contract. Neither the Certificate of Acceptance nor the final payment nor any provision in the contract documents shall relieve the CONTRACTOR of the obligation for fulfillment of any warranty which may be required by law or by the contract documents.

6.10 CORRECTION OF WORK BEFORE FINAL PAYMENT. The CONTRACTOR shall promptly remove from Owner’s premises all materials deemed unsuitable by the ENGINEER on account of failure to conform to the Contract, whether actually incorporated in the work or not, and CONTRACTOR shall, at his own expense, promptly replace such condemned materials with other materials conforming to the requirements of the Contract. The CONTRACTOR shall also bear the expense of restoring all work of other CONTRACTORs damaged by any such removal or replacement. If CONTRACTOR does not remove and replace any such condemned work within a reasonable time after receipt of a written notice from the Owner or the ENGINEER, the Owner may remove and replace it at CONTRACTOR’s expense.

6.11 CORRECTION OF WORK AFTER FINAL PAYMENT. Neither the final payment nor certificate nor any provision in this Contract shall relieve the CONTRACTOR of responsibility for faulty materials or workmanship, and he shall remedy any defects due thereto and pay for any damage to other work resulting therefrom, which shall appear within a period of one (1) year from the date of substantial completion. The Owner or the ENGINEER shall give notice of observed defects with reasonable promptness.

6.12 PAYMENTS WITHHELD. The Owner may, on account of subsequently discovered evidence, withhold or nullify the whole or part of any certificate or withhold partial or full payment to such extent as may be necessary to protect himself from loss on account of:

(1) Defective work not remedied;
(2) Claims filed or reasonable evidence indicating probable filing of claims;
(3) Failure of the CONTRACTOR to make payments properly to subcontractors or for material or labor;
(4) Damage to another CONTRACTOR;
(5) Reasonable doubt that the work can be completed for the unpaid balance of the contract amount;
(6) Reasonable indication that the work will not be completed within the contract time.
(7) Failure on the part of the CONTRACTOR to execute any and all documents, releases or other documents presented to the CONTRACTOR for execution, as provided for herein or otherwise.

When the above grounds are removed or the CONTRACTOR provides a Surety Bond satisfactory to the Owner, which will protect the Owner in the amount withheld, payment may be made for the amounts withheld because of them. However, the Owner shall have the discretion of withholding or making payment in the event any of items (1) through (7) shall be applicable to the work or progress thereof.

6.13 DELAYED PAYMENTS. Should the Owner fail to make payment to the CONTRACTOR of the sum named in any partial or final statement, when payment is due, after the same has been recommended for payment by both the ENGINEER and the CONTRACTOR, and the CONTRACTOR has met all other conditions stipulated herein or in the contract documents entitling the CONTRACTOR to payment, then the Owner shall pay to the CONTRACTOR, in addition to the sum shown as due by such statement, interest thereon at the rate of six percent (6%) per annum from date due, as provided under "6.06 PARTIAL PAYMENTS" and "6.09 FINAL PAYMENT", until fully paid, which shall fully liquidate any injury to the CONTRACTOR growing out of such delay in payment; but the right is expressly reserved to the CONTRACTOR, in the event payments be not promptly made as provided under "6.06 PARTIAL PAYMENTS", to at any time thereafter treat the Contract as abandoned by the Owner and to recover compensation as provided under "8. ABANDONMENT OF CONTRACT", unless such payments are withheld in accordance with the provisions of "6.12 PAYMENTS WITHHELD".

7. EXTRA WORK AND CLAIMS

7.01 CHANGE ORDERS. Without invalidating this Agreement, the Owner may, at any time or from time to time, as the need arises, order changes not within the Scope of Work; such changes will be authorized by Change Order to be prepared by the ENGINEER for execution by the Owner and the CONTRACTOR. The Change Order shall set forth the basis for any change in original contract amount, as hereinafter set forth for Extra Work, and any change in contract time which may result from the change.

In the event the CONTRACTOR shall refuse to approve a Change Order which has been prepared by the ENGINEER, the ENGINEER may instruct the CONTRACTOR, in writing, to

proceed with the work as set forth in the Change Order, and the CONTRACTOR may make a claim against the Owner for Extra Work involved therein. However, the CONTRACTOR shall only be entitled to payment upon the execution of the final certification and release in a form as provided for herein, and CONTRACTOR shall approve such certification before the Owner shall be obligated to make payment.

7.02 MINOR CHANGES. The ENGINEER may authorize minor changes in the work not inconsistent with the overall intent of the contract documents and not involving an increase in contract price. If the CONTRACTOR believes that any minor changes or alteration authorized by the ENGINEER involves Extra Work or entitles him to an increase in the contract price, the CONTRACTOR shall make written request to the ENGINEER for a written Field Order.

In such case, the CONTRACTOR, by copy of his communication to the ENGINEER or otherwise in writing, shall advise the Owner of his request to the ENGINEER for a written Field Order and that the work involved may result in an increase in the contract price.

Any request by the CONTRACTOR for a change in contract price shall be made prior to beginning the work covered by the proposed change.

7.03 EXTRA WORK. It is agreed that the CONTRACTOR shall perform all Extra Work under the direction of the ENGINEER when presented with a written work order signed by the ENGINEER, subject, however, to the right of the CONTRACTOR to require written confirmation of such Extra Work order by the Owner. It is agreed that the basis of compensation to the CONTRACTOR for work either added or deleted by a Change Order, or for which a claim for Extra Work is made, shall be determined by one or more of the following methods:

Method (A) -- By agreed unit prices; or

Method (B) -- By agreed lump sum; or

Method (C) -- If neither Method (A) nor Method (B) be agreed upon before the Extra Work is commenced, then the CONTRACTOR shall be paid the "actual field cost" of the work, plus fifteen percent (15%).

In the event said Extra Work is performed and paid for under Method (C), then the provisions of this paragraph shall apply and the "actual field cost" is hereby defined to include the cost to the CONTRACTOR of all workers, such as foremen, timekeepers, mechanics and laborers, and materials, supplies, trucks, rentals on machinery and equipment, for the time actually employed or used on such Extra Work, plus actual transportation charges necessarily incurred together with all power, fuel, lubricants, water and similar operating expenses, plus all necessary incidental expenses incurred directly on account of such Extra Work, including Social Security, Old Age Benefits and other payroll taxes, and a rateable proportion of premiums on Performance and Payment Bonds and Maintenance Bonds, Public Liability and Property Damage and Worker's Compensation, and all other insurance as may be required by law or ordinance, or directed by the Owner, or by them agreed to when such costs are actually increased due to the Extra Work. “Actual field cost” may be decreased by any amount which is solely attributable to delays or additional costs caused by the CONTRACTOR, such as, but not limited to, CONTRACTOR’s failure to pursue work continuously.

The ENGINEER may direct the form in which accounts of the "actual field cost" shall be kept and the records of these accounts shall be made available to the ENGINEER. The ENGINEER or Owner may also specify in writing, before the work commences, the method of doing the work and the type and kind of machinery and equipment to be used; otherwise these matters shall be determined by the CONTRACTOR. Unless otherwise agreed upon, the prices for the use of machinery and equipment shall be determined by using one hundred percent (100%), unless otherwise specified, of the latest schedule of Equipment Ownership Expense adopted by the Associated General CONTRACTORs of America where practicable, and the terms and prices for the use of machinery and equipment shall be incorporated in the written Extra Work Order. The fifteen percent (15%) of the "actual field cost" to be paid to the CONTRACTOR, shall cover and compensate him for his profit, overhead, general superintendence and field office expense, and all other elements of cost and expense not embraced within the "actual field cost" as herein defined, save that where the CONTRACTOR's camp or field office must be maintained primarily on account of such Extra Work, then the cost to maintain and operate the same shall be included in the "actual field cost."

No claim for Extra Work of any kind will be allowed unless ordered in writing by the ENGINEER. In case any orders or instructions, either oral or written, appear to the CONTRACTOR to involve Extra Work for which he should receive compensation or an adjustment in the construction time, he shall make written request to the ENGINEER for written order authorizing such Extra Work. Should a difference of opinion arise as to what does or does not constitute Extra Work, or as to the payment therefor, and the ENGINEER insists upon its performance, the CONTRACTOR shall proceed with the work after making written request for written order and shall keep an accurate account of the “actual field cost” thereof, as provided under Method (C). The CONTRACTOR shall then have the right to submit his claim directly to the Owner by proper certification and attestation, on forms provided by the Owner. If the Owner shall fail to pay or guarantee to pay said amount claimed within thirty (30) days of the date of submission, the CONTRACTOR shall have the right to file suit in the District Court of the County designated on the Agreement Form, for declaratory judgment or other relief, to determine his rights to such claim, and if he shall fail to file suit within sixty (60) days after the date of presentment to the Owner, the CONTRACTOR shall lose and forfeit his right to make such claim for Extra Work at any later date, and all claims held by the CONTRACTOR shall be deemed forfeited and forever barred if the CONTRACTOR shall accept final payment without having first filed suit in the District Court.

7.04 TIME OF FILING CLAIMS. It is further agreed by both parties hereto that all questions of dispute or adjustment presented by the CONTRACTOR shall be in writing and filed with the ENGINEER within thirty (30) days after the ENGINEER has given any directions, order or instruction to which the CONTRACTOR desires to take exception. The ENGINEER shall reply within thirty (30) days to such written exceptions by the CONTRACTOR and render his final decision in writing. In case the CONTRACTOR should desire to appeal from the ENGINEER's decision, the CONTRACTOR may request a meeting between representatives of the Owner and the CONTRACTOR for the purposes of appealing the ENGINEER's decision directly to the Owner, such meeting to occur within ten (10) days after the date of the delivery to the CONTRACTOR of the ENGINEER's final decision. If the CONTRACTOR shall still be aggrieved after a meeting with the Owner and/or his representative, the CONTRACTOR shall have sixty (60) days after the date of the delivery to the CONTRACTOR of the ENGINEER's final decision, to appeal the same to the District Court of the County designated on the Agreement Form, by filing suit for declaratory judgment or other appropriate relief. In the event the CONTRACTOR shall fail, for any reason, to

file suit, and shall accept final payment for all work completed, the Owner shall be released of any and all liability, and the action by the CONTRACTOR in accepting final payment shall constitute a final bar and satisfaction of all claims held by the CONTRACTOR against the Owner.

8. ABANDONMENT OF CONTRACT

8.01 ABANDONMENT BY CONTRACTOR. In case the CONTRACTOR should abandon and fail or refuse to resume work within ten (10) days after written notification from the Owner or the ENGINEER, or if the CONTRACTOR fails to comply with the orders of the ENGINEER when such orders are consistent with the contract documents, then and in that case, where Performance and Payment Bonds exist, the sureties on these bonds shall be notified in writing and directed to complete the work, and a copy of said notice shall be delivered to the CONTRACTOR.

After receiving said notice of abandonment, the CONTRACTOR shall not remove from the work any machinery, equipment, tools, materials or supplies then on the job, but the same, together with any materials and equipment under contract for the work, may be held for use on the work by the Owner or the surety on the Performance Bond, or another CONTRACTOR in completion of the work; and the CONTRACTOR shall not receive any rental or credit therefor, it being understood that the use of such equipment and materials will ultimately reduce the cost to complete the work and be reflected in the final settlement.

Where there is no Performance Bond or in case the surety should fail to commence compliance with the notice for completion hereinabove provided for within ten (10) days after the service of such notice, then the Owner may provide for completion of the work in either of the following elective manners:

(a) The Owner may thereupon employ such force of workers and use such machinery, equipment, tools, and supplies as the Owner may deem necessary to complete the work and charge the expense of such labor, machinery, equipment, tools, materials and supplies to said CONTRACTOR, and expense so charged shall be deducted and paid by the Owner out of such monies as may be due or that may thereafter at any time become due to the CONTRACTOR under and by virtue of this Agreement. In case such expense is less than the sum which would have been payable under this Contract if the same had been completed by the CONTRACTOR, then said CONTRACTOR shall receive the difference. In case such expense is greater than the sum which would have been payable under this Contract if the same had been completed by such CONTRACTOR, then the CONTRACTOR and/or his surety shall pay the amount of such excess to the Owner; or

(b) The Owner, under sealed bids, under the times and procedures provided for by law, may let the contract for completion of the work under substantially the same terms and conditions which are provided in this Contract. In case of any increase in cost to the Owner under the new contract, as compared to what would have been the cost under this Contract, such increase shall be charged to the CONTRACTOR, and the surety shall be and remain bound therefor. However, should the cost to complete any such new contract prove to be less than what would have been the cost to complete under this Contract, the CONTRACTOR and/or his surety shall be credited therewith.

When the work shall have been completed, the CONTRACTOR and his surety shall be so notified and Certificates of Completion and Acceptance, as hereinabove provided, shall be issued. A complete itemized statement of the contract accounts, certified by the ENGINEER as being correct, shall then be prepared and delivered to the CONTRACTOR and his surety, whereupon the CONTRACTOR and/or his surety shall pay the balance due as reflected by said statement, within fifteen (15) days after the date of such Certificate of Completion. The Owner, prior to incurring an obligation to make payment hereunder, shall have such statement of completion attested to by the CONTRACTOR as accurate, and upon payment of the sum stated therein, the Owner shall be entitled to full and final release of any claims or demands by the CONTRACTOR.

In the event the statement of accounts shows that the cost to complete the work is less than that which would have been the cost to the Owner had the work been completed by the CONTRACTOR under the terms of this Contract, or when the CONTRACTOR and/or his surety shall pay the balance shown to be due by them to the Owner, then all machinery, equipment, tools or supplies left on the site of the work shall be turned over to the CONTRACTOR and/or his surety. Should the cost to complete the work exceed the contract price, and the CONTRACTOR and/or his surety fail to pay the amount due the Owner within the time designated above, and there remains any machinery, equipment, tools, materials or supplies on the site of the work, notice thereof, together with an itemized list of such equipment and materials, shall be mailed to the CONTRACTOR and his surety at the respective addresses designated in the Contract, provided, however, that actual written notice given in any manner will satisfy this condition. After mailing or other giving of such notice, such property shall be held at the risk of the CONTRACTOR and his surety, subject only to the duty of the Owner to exercise ordinary care to protect such property. After fifteen (15) days from the date of such notice, the Owner may sell such property, equipment, tools, materials or supplies, and apply the net sum derived from such sale to the credit of the CONTRACTOR and his surety. Such sale may be made at either public or private sale, with or without notice, as the Owner may elect. The Owner shall release any machinery, equipment, tools, materials or supplies, which remain on the work, and belong to persons other than the CONTRACTOR or his surety, to their proper owners. The books on all operations provided herein shall be open to the CONTRACTOR and his surety.

8.02 ABANDONMENT BY OWNER. In case the Owner shall fail to comply with the terms of this Contract and should fail or refuse to comply with said terms within ten (10) days after written notification by the CONTRACTOR, then the CONTRACTOR may suspend or wholly abandon the work, and may remove therefrom all machinery, tools and equipment, and all materials on the site of the work that have not been included in payments to the CONTRACTOR and have not been wrought into the work. And thereupon, the ENGINEER shall make an estimate of the total amount earned by the CONTRACTOR, which estimate shall include the value of all work actually completed by said CONTRACTOR (at the prices stated in the attached Proposal where unit prices are used), the value of all partially completed work at a fair and equitable price, and the amount of all Extra Work performed at the prices agreed upon, or provided for by the terms of this Contract, and a reasonable sum to cover the cost of any provisions made by the CONTRACTOR to carry the whole work to completion and which cannot be utilized. The ENGINEER shall then make a final statement of the balance due the CONTRACTOR by deducting from the above estimate all previous payments by the Owner and all other sums that may be retained by the Owner under the terms of this Agreement, and shall present the same to the CONTRACTOR for the CONTRACTOR's approval; and upon the CONTRACTOR's approving the same as being true, correct and accurate, and upon payment of said sum, the CONTRACTOR shall release the Owner of any and all liability growing

out of or by reason of said Contract, and then the same shall be presented to the Owner, who shall pay to the CONTRACTOR, on or before thirty (30) days after the date of notification by the CONTRACTOR of the balance shown by said final statement as due the CONTRACTOR under the terms of this Agreement.

ATTACHMENT NO. 1 TO GENERAL CONDITIONS

WORKERS' COMPENSATION INSURANCE COVERAGE

A. DEFINITIONS:

Certificate of coverage ("certificate") - A copy of a certificate of insurance, a certificate of authority to self-insure issued by the commission, or a coverage agreement (TWCC-81, TWCC-82, TWCC-83 or TWCC-84), showing statutory workers' compensation insurance coverage for the person's or entity's employees providing services on a project for the duration of the project.

Duration of the project - includes the time from the beginning of the work on the project until the CONTRACTOR's/person's work on the project has been completed and accepted by the governmental entity.

Persons providing services on the project ("subcontractor" in 406.096) - includes persons or entities performing or part of the services the CONTRACTOR has undertaken to perform on the project, regardless of whether that person contracted directly with the CONTRACTOR and regardless of whether that person has employees. This includes, without limitation, independent CONTRACTORs, subcontractors, leasing companies, motor carriers, owner-operators, employees of any such entity, or employees of any entity which furnishes persons to provide services on the project. "Services" include, without limitation, providing, hauling, or delivering equipment or materials, or providing labor, transportation, or other services related to a project. "Services" does not include activities unrelated to the project, such as food/beverage vendors, office supply deliveries, and delivery of portable toilets.

B. The CONTRACTOR shall provide coverage, based on proper reporting of classification codes and payroll amounts and filing of any coverage agreements, which meets the statutory requirements of Texas Labor Code, Section 401.011 (44) for employees of the CONTRACTOR providing services on the project for the duration of the project.

C. The CONTRACTOR must provide a certificate of coverage to the Owner prior to being awarded the contract.

D. If the coverage period shown on the CONTRACTOR's current certificate of coverage ends during the duration of the project, the CONTRACTOR must, prior to the end of the coverage period, file a new certificate of coverage with the governmental entity showing that coverage has been extended.

E. The CONTRACTOR shall obtain from each person providing services on a project, and provide to the governmental entity:

(1) a certificate of coverage, prior to that person beginning work on the project, so the governmental entity will have on file certificates of coverage showing coverage for all persons providing services on the project; and

(2) no later than seven days after receipt by the CONTRACTOR, a new certificate of coverage showing extension of coverage, if the coverage period shown on the current certificate of coverage ends during the duration of the project.

F. The CONTRACTOR shall retain all required certificates of coverage for the duration of the project and for one year thereafter.

G. The CONTRACTOR shall notify the governmental entity in writing by certified mail or personal delivery, within 10 days after the CONTRACTOR knew or should have known, of any changes that materially affect the provision of coverage of any person providing services on the project.

H. The CONTRACTOR shall post on each project site a notice, in the text, form and manner prescribed by the Texas Worker's Compensation Commission, informing all persons providing services on the project that they are required to be covered, and stating how a person may verify coverage and report lack of coverage.

NOTICE
REQUIRED WORKER'S COMPENSATION COVERAGE

"The law requires that each person working on this site or providing services related to this construction project must be covered by worker's compensation insurance. This includes persons providing, hauling, or delivering equipment or materials, or providing labor or transportation or other service related to the project, regardless of the identify of their employer or status as an employee."

"Call the Texas Worker's Compensation Commission at (512) 440-3789 to receive information on the legal requirements for coverage, to verify whether your employer has provided the required coverage, or to report an employer's failure to provide coverage."

I. The CONTRACTOR shall contractually require each person with whom it contracts to provide services on a project, to:

1. provide coverage, based on proper reporting of classification codes and payroll amounts and filing of any coverage agreements, which meets the statutory requirements of Texas Labor Code, Section 401.011 (44) for all of its employees providing services on the project, for the duration of the project;

2. provide to the CONTRACTOR, prior to that person beginning work on the project, a certificate of coverage showing that coverage is being provided for all employees of the person providing services on the project, for the duration of the project:

3. provide the CONTRACTOR, prior to the end of the coverage period, a new certificate of coverage, showing extension of coverage, if the coverage period shown on the current certificate of coverage ends during the duration of the project;

4. obtain from each other person with whom it contracts, and provide to the CONTRACTOR:

   a. a certificate of coverage, prior to the other person beginning work on the project; and

   b. a new certificate of coverage shown extension of coverage, prior to the end of the coverage period, if the coverage period shown on the current certificate of coverage ends during the duration of the project;

5. retain all required certificates of coverage on file for the duration of the project and for one year thereafter;

6. notify the governmental entity in writing by certified mail or personal delivery, within 10 days after the person knew or should have known, of any change that materially affects the provision of coverage of any person providing services on the project; and

7. contractually require each person with whom it contracts, to perform as required by paragraphs (1) - (7), with the certificates of coverage to be provided to the person for whom they are providing services.

J. By signing this contract or providing or causing to be provided a certificate of coverage, the CONTRACTOR is representing to the governmental entity that all employees of the CONTRACTOR who will provide services on the project will be covered by worker's compensation coverage for the duration of the project, that the coverage agreements will be based on proper reporting of classification codes and payroll amounts, and that all coverage agreements will be filed with the appropriate insurance carrier or, in the case of a self-insured, with the commission's Division of Self-Insurance Regulation. Providing false or misleading information may subject the CONTRACTOR to administrative penalties, criminal penalties, civil penalties, or other civil actions.

K. The CONTRACTOR's failure to comply with any of these provisions is a breach of contract by the CONTRACTOR which entitles the governmental entity to declare the CONTRACTOR void if the CONTRACTOR does not remedy the breach within ten days after receipt of notice of breach from the governmental entity.

ATTACHMENT NO. 2 TO GENERAL CONDITIONS

AGREEMENT FOR FINAL PAYMENT
AND CONTRACTOR'S SWORN RELEASE

In order to insure that the rights, obligations and responsibilities of all parties to the original contract document are fully protected, which contract document was signed and executed on the day of _____, 20__ by _____, referred to therein as CONTRACTOR and hereinafter referred to as CONTRACTOR, and the OWNER on the day of _____, 20___, and further in consideration for the final payment of all sums due and claimed by the CONTRACTOR against the OWNER, the CONTRACTOR makes the following representations to the OWNER, either individually if a proprietorship, jointly by all partners if a partnership, or if a corporation, by action of the president and secretary of said corporation, as duly authorized by appropriate action of the stockholders and/or board of directors of said corporation, their signatures hereon constituting a representation under oath by said individuals that they have the power and authority to execute this Agreement for and on behalf of the said corporation:

I.

The CONTRACTOR has received _____ (number) payments pursuant to _____ (number) of CONTRACTOR Payment Estimates, copies of which are attached hereto presented to the OWNER and paid during the progress of the job referred to in the Contract between the parties; and in this regard, the undersigned CONTRACTOR represents to the OWNER that it does not claim nor intend to claim at any future date, any additional sums of money of any nature whatsoever under and by virtue of the payment estimates previously submitted to the Engineer for approval, or any other sums of money of any nature whatsoever for materials furnished and used in the job or for work done, and hereby releases and discharges the OWNER from any liabilities of any nature

whatsoever, for any claims of any nature made by the CONTRACTOR at some future date, or by its successors or assigns.

II.

The undersigned CONTRACTOR further represents to the OWNER that the Final Payment Estimate, reflecting all associated Change Orders, if any, submitted by the CONTRACTOR to the OWNER, whether or not modified, corrected or changed in some way by deletions or other modifications by the Engineer, the CONTRACTOR or the OWNER, a copy of which is attached is true, correct and accurate; and it is further agreed and stipulated by the undersigned CONTRACTOR that upon the receipt of final payment in the amount as set out on the Final Payment Estimate, the CONTRACTOR, by execution of this instrument of release, does, therefore, release and forever discharge the OWNER of and from all manner of debts, demands, obligations, suits, liabilities and causes of action of any nature whatsoever under and by virtue of the terms and provisions of the Contract hereinbefore referred to, and any change or modification thereof, or in any manner growing out of or arising from or by virtue of the work, labor and services performed by the CONTRACTOR.

III.

CONTRACTOR, in addition to the provisions set out in the contract document, agrees to indemnify and hold the OWNER harmless from any and all causes of action, claims, demands or suits made by any person or other entity against the OWNER, by reason of the work performed by such CONTRACTOR, and agrees to defend or to cause the same to be defended at the CONTRACTOR's sole expense and obligation, whenever such actions may be brought, and further to pay all costs incurred by the OWNER in the defense thereof, including administrative costs and attorney's fees, and further to pay any judgments or settlements which may be entered into or agreed to against or for the benefit of the OWNER. It is, however, specifically agreed that the OWNER

shall not enter into any settlement agreements without the acquiescence and agreement of the CONTRACTOR.

IV.

The CONTRACTOR, acting by and through the person or persons whose names are subscribed hereto, does solemnly swear and affirm that all bills and claims have been paid to all materialmen, suppliers, laborers, subcontractors, or other entities performing services or supplying materials, and that the OWNER shall not be subject to any bills, claims, demands, litigation or suits in connection therewith.

V.

It is further specifically understood and agreed that this Agreement for Final Payment and Contractor's Sworn Release shall constitute a part of the original Contract of the parties heretofore previously referred to, and it is also specifically understood and agreed that this Agreement shall not act as a modification, waiver or renunciation by the OWNER of any of its rights or remedies as set out in the contract itself, but this Agreement for Final Payment and Contractor's Sworn Release shall constitute a supplement thereto for the additional protection of the OWNER.

VI.

This Agreement for Final Payment and Contractor's Sworn Release shall be considered to be continuing and binding upon the parties hereto and shall not terminate upon receipt and acceptance by the CONTRACTOR of final payment, but shall be deemed continuing so long as any actions, claims or other demands contemplated herein against the OWNER, may lawfully be brought under applicable statutes of limitations, and shall in addition be deemed to be continuing for such additional period of time as shall be necessary to compensate and repay to the OWNER, all costs or damages incurred by it by reason of such claims.

SIGNED and EXECUTED this, the ____ day of _____, 20___.

CONTRACTOR

_____
Signature

Print Name: _____

[If CONTRACTOR is a sole proprietorship, OWNER must sign; if a partnership, each partner must sign; if a corporation, the following language should be used.]

SIGNED and EXECUTED this, the _____ day of _____, 20___, by _____, a Texas corporation, under authority granted to the undersigned by said corporation as contained in the Charter, By-Laws or Minutes of a meeting of said corporation regularly called and held.

CONTRACTOR

By: _____
President

ATTEST:

_____
Corporate Secretary
(Corporate Seal)

[This form is for use by either a proprietorship or a partnership. In the event CONTRACTOR is a partnership or a joint proprietorship, additional signature lines should be added for each individual.]

AFFIDAVIT

STATE OF TEXAS

COUNTY OF GALVESTON

BEFORE ME, the undersigned authority, on this day personally appeared the person or persons whose name(s) are subscribed to the above and foregoing Agreement for Final Payment and Contractor's Sworn Release, who each, after being by me duly sworn, on their oaths deposed and said:

> I(We) am(are) the person(s) who signed and executed the above and foregoing Agreement for Final Payment and Contractor's Sworn Release, and I(we) have read the facts and statements as therein set out and the representations as made therein, and I(we) state that the above and foregoing are true and correct.

_____
CONTRACTOR - Affiant

SWORN TO AND SUBSCRIBED TO before me this, the _____day of _____, 20__.

_____
Notary Public, State of Texas

My Commission Expires: _____

[This form is for use in the event CONTRACTOR is a corporation.]

AFFIDAVIT

STATE OF TEXAS

COUNTY OF GALVESTON

BEFORE ME, the undersigned authority, on this day personally appeared the persons who signed and executed the above and foregoing Agreement for Final Payment and Contractor's Sworn Release, whose names are set out above, who each, after being by me duly sworn, on their oaths deposed and said:

> We each are the persons whose names are subscribed above, and hold respectively the offices in the corporation as set out above, and each state under oath that we have the authority to execute this Agreement for Final Payment and Contractor's Sworn Release for and on behalf of said corporation, pursuant to authority granted to us in the Charter of said corporation, the By-Laws of said corporation and/or the Minutes of said corporation; and the facts, statements and representations as set out in the instrument to which this Affidavit is attached, are true and correct.

_____

_____

SWORN TO AND SUBSCRIBED TO before me this, the____ day of _____, 20___.

_____
Notary Public, State of Texas

My Commission Expires: _____

STATE OF _____

COUNTY OF _____

SUBCONTRACTOR/MATERIALMAN'S
FULL AND FINAL
RELEASE AND WAIVER OF CLAIMS AND LIENS

For consideration in hand paid, _____, (Company) does hereby certify and acknowledge that Company has been fully paid for all work and labor done by it, and for materials supplied by it, to date on that certain project described as follows:

Contractor: _____
Project Description: _____

Obligee: _____
Amount: _____

Company does hereby waive all rights, claims and liens which it may have, or be entitled including statutory and constitutional liens on such project for such work and labor done and material supplied by it to date, or arising out of such transactions.

Company hereby releases in full all claims and liens it has heretofore filed on such property for such work including labor and material.

Executed this _____ day of _____, 20____.

By: _____

STATE OF _____

COUNTY OF _____

BEFORE ME, the undersigned, a Notary Public in and for said County, _____ on this day personally appeared _____ Known to me to be the person and officer whose name is subscribed to the foregoing instrument and acknowledged to me that the same was the act of the said _____, a corporation, and that he executed the same as the act of such corporation for the purposes and consideration therein expressed and in the capacity therein stated.

GIVEN UNDER MY HAND AND SEAL OF OFFICE, this _____day of _____, 20____.

_____
Notary Public

CONSENT OF
SURETY COMPANY
TO FINAL PAYMENT
Conforms with the American Institute of Architects, AIA Document G707

Owner
Architect
Contractor
Surety
Other

PROJECT:
(Name, address)

TO (Owner)

ARCHITECT'S PROJECT NO:

CONTRACT FOR:

CONTRACT DATE:

CONTRACTOR:

In accordance with the provisions of the Contract between the Owner and the Contractor as indicated above, the
(here insert name and address of Surety Company)

, SURETY COMPANY

on bond of (here insert name and address of Contractor)

CONTRACTOR,

hereby approves of the final payment to the Contractor, and agrees that final payment to the Contractor shall not relieve the Surety Company of any of its obligations to (here insert name and address of Owner)

, OWNER,

as set forth in the said Surety Company's bond.

IN WITNESS, WHEREOF,
the Surety Company has hereunto set its hand this day of

Surety Company

Attest:
(Seal):

Signature of Authorized Representative

Title

NOTE: This form is be used as a companion document to AIA DOCUMENT G706, CONTRACTOR'S AFFIDAVIT OF PAYMENT OF DEBTS AND CLAIMS, Current Edition

"General Decision Number: TX20190062 01/04/2019

Superseded General Decision Number: TX20180094

State: Texas

Construction Type: Heavy

County: Galveston County in Texas.

HEAVY CONSTRUCTION PROJECTS Including Water and Sewer Lines
(Does Not Include Flood Control)

Note: Under Executive Order (EO) 13658, an hourly minimum wage of $10.60 for calendar year 2019 applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2015. If this contract is covered by the EO, the contractor must pay all workers in any classification listed on this wage determination at least $10.60 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on the contract in calendar year 2019. If this contract is covered by the EO and a classification considered necessary for performance of work on the contract does not appear on this wage determination, the contractor must pay workers in that classification at least the wage rate determined through the conformance process set forth in 29 CFR 5.5(a)(1)(ii) (or the EO minimum wage rate, if it is higher than the conformed wage rate). The EO minimum wage rate will be adjusted annually. Please note that this EO applies to the above-mentioned types of contracts entered into by the federal government that are subject to the Davis-Bacon Act itself, but it does not apply to contracts subject only to the Davis-Bacon Related Acts, including those set forth at 29 CFR 5.1(a)(2)-(60). Additional information on contractor requirements and worker protections under the EO is available at www.dol.gov/whd/govcontracts.

Modification Number	Publication Date
0	01/04/2019

* SFTX0669-001 04/01/2017

	Rates	Fringes
SPRINKLER FITTER (Fire Sprinklers)	$ 29.03	15.84

SUTX2005-021 08/05/2005

HEAVY Including Water and Sewer Lines (Excluding Flood Control)

	Rates	Fringes
Carpenter	$ 14.38	
Cement mason/concrete finisher	$ 11.37	1.13
Electrician	$ 18.40	1.34
FORM BUILDER/FORM SETTER	$ 13.35	1.17
IRONWORKER, REINFORCING	$ 11.29	
Laborers:		
Common	$ 10.70	
Landscape	$ 7.35	
Mason Tender Cement	$ 9.96	
Pipelayer	$ 10.07	
PIPEFITTER	$ 17.00	0.04
Power equipment operators:		
Excavator	$ 16.74	
Backhoe	$ 13.25	
Bulldozer	$ 14.00	
Crane	$ 14.91	0.58
Front End Loader	$ 11.75	0.92
Grader	$ 12.20	1.48
Tractor	$ 12.38	1.51
TRUCK DRIVER	$ 12.28	0.98

WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.

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Note: Executive Order (EO) 13706, Establishing Paid Sick Leave

for Federal Contractors applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2017. If this contract is covered by the EO, the contractor must provide employees with 1 hour of paid sick leave for every 30 hours they work, up to 56 hours of paid sick leave each year. Employees must be permitted to use paid sick leave for their own illness, injury or other health-related needs, including preventive care; to assist a family member (or person who is like family to the employee) who is ill, injured, or has other health-related needs, including preventive care; or for reasons resulting from, or to assist a family member (or person who is like family to the employee) who is a victim of, domestic violence, sexual assault, or stalking. Additional information on contractor requirements and worker protections under the EO is available at www.dol.gov/whd/govcontracts.

Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29CFR 5.5 (a) (1) (ii)).

The body of each wage determination lists the classification and wage rates that have been found to be prevailing for the cited type(s) of construction in the area covered by the wage determination. The classifications are listed in alphabetical order of ""identifiers"" that indicate whether the particular rate is a union rate (current union negotiated rate for local), a survey rate (weighted average rate) or a union average rate (weighted union average rate).

Union Rate Identifiers

A four letter classification abbreviation identifier enclosed in dotted lines beginning with characters other than ""SU"" or ""UAVG"" denotes that the union classification and rate were prevailing for that classification in the survey. Example: PLUM0198-005 07/01/2014. PLUM is an abbreviation identifier of the union which prevailed in the survey for this classification, which in this example would be Plumbers. 0198 indicates the local union number or district council number where applicable, i.e., Plumbers Local 0198. The next number, 005 in the example, is an internal number used in processing the wage determination. 07/01/2014 is the effective date of the

most current negotiated rate, which in this example is July 1, 2014.

Union prevailing wage rates are updated to reflect all rate changes in the collective bargaining agreement (CBA) governing this classification and rate.

Survey Rate Identifiers

Classifications listed under the ""SU"" identifier indicate that no one rate prevailed for this classification in the survey and the published rate is derived by computing a weighted average rate based on all the rates reported in the survey for that classification. As this weighted average rate includes all rates reported in the survey, it may include both union and non-union rates. Example: SULA2012-007 5/13/2014. SU indicates the rates are survey rates based on a weighted average calculation of rates and are not majority rates. LA indicates the State of Louisiana. 2012 is the year of survey on which these classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. 5/13/2014 indicates the survey completion date for the classifications and rates under that identifier.

Survey wage rates are not updated and remain in effect until a new survey is conducted.

Union Average Rate Identifiers

Classification(s) listed under the UAVG identifier indicate that no single majority rate prevailed for those classifications; however, 100% of the data reported for the classifications was union data. EXAMPLE: UAVG-OH-0010 08/29/2014. UAVG indicates that the rate is a weighted union average rate. OH indicates the state. The next number, 0010 in the example, is an internal number used in producing the wage determination. 08/29/2014 indicates the survey completion date for the classifications and rates under that identifier.

A UAVG rate will be updated once a year, usually in January of each year, to reflect a weighted average of the current negotiated/CBA rate of the union locals from which the rate is based.

WAGE DETERMINATION APPEALS PROCESS

1.) Has there been an initial decision in the matter? This can be:

* an existing published wage determination
* a survey underlying a wage determination
* a Wage and Hour Division letter setting forth a position on a wage determination matter
* a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests for summaries of surveys, should be with the Wage and Hour Regional Office for the area in which the survey was conducted because those Regional Offices have responsibility for the Davis-Bacon survey program. If the response from this initial contact is not satisfactory, then the process described in 2.) and 3.) should be followed.

With regard to any other matter not yet ripe for the formal process described here, initial contact should be with the Branch of Construction Wage Determinations. Write to:

Branch of Construction Wage Determinations
Wage and Hour Division
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

2.) If the answer to the question in 1.) is yes, then an interested party (those affected by the action) can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Write to:

Wage and Hour Administrator
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and by any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3.) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

4.) All decisions by the Administrative Review Board are final.

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END OF GENERAL DECISION
"

SPECIAL CONDITIONS

1. SPECIAL CONDITIONS are inserted to describe additional requirements applicable to this Contract. In the event of conflict between requirements as set forth the SPECIAL CONDITIONS and the General Conditions of Agreement or Technical Specification items, the requirements as set forth in the SPECIAL CONDITIONS shall govern.

2. Prices in the Contract Documents include all compensation for full completion of all work items in place, and include providing all labor, materials, tools, equipment, services, supplies, incidentals, and all necessary operations.

3. Work not specifically set forth in the Bid Proposal as pay items shall be considered subsidiary obligations of Contractor and costs shall be included in the item bid prices named in the unit Bid Proposal.

4. Permits. Contractor is responsible to obtain all necessary permits to accomplish the Work described within these documents.

   It is the Contractor's responsibility to coordinate with the Owner to determine all requirements and to meet such requirements.

5. Warranty - Neither the final payment nor certificate nor any provision in this Contract shall relieve the Contractor of responsibility for faulty materials or workmanship, and he shall remedy any defects due thereto and pay for any damage to other work resulting therefrom, which shall appear within a period of one (1) year from the date of final acceptance. The final acceptance date is determined after the final walk through of the project has occurred and the punch list items identified from the final walk through have been completed by the Contractor. The Contractor shall notify the Owner in writing upon completion of the punch list items. Certificate of acceptance will be issued upon verification by the Engineer of the completion of punch list items from "final walk through" and a submittal of the close-out documents by the Contractor. The Warranty period will commence from the date of final acceptance for the entire project, regardless of completion of work in the individual project areas.

6. Guarantees - Guarantee work, including equipment installed, to be free from defects due to faulty workmanship or materials for period of one year from date of issue of Certificate of Acceptance. Upon notice from Owner, repair defects in all construction which develop during specified period at no cost to Owner. Neither final acceptance nor final payment nor any provision in Contract Documents relieves Contractor of above guarantee. Notice of observed defects will be given with reasonable promptness. Failure to repair or replace defect upon notice entitles Owner to repair or replace same and recover reasonable cost thereof from Contractor and/or his Surety.

7. Taxes and Insurance. In addition to the general obligations and responsibilities for insurance and protection set out in the General Conditions of Agreement of these Specifications, the Contractor shall comply with the following provisions:

A. The Contractor acknowledges that he has qualified and will make all payments under the terms of the Unemployment Compensation Law of the State in which the work is performed.

B. The Contractor, and all subcontractors employed on the work, shall carry insurance of minimum limits as stated in the General Conditions of Agreement.

C. The Contractor, before starting work for the Owner, must furnish to the Owner Certificates of Insurance or other acceptable evidences from a reputable insurance company or companies (such companies to be acceptable to the Owner) licensed to write insurance in the State of Texas, showing that the Contractor is covered by the insurance as stated in the General Conditions of Agreement.

D. The certificates of insurance furnished to the Owner shall contain a provision that coverage under such policies shall not be canceled or materially changed until at least 30 days prior written notice have been given to the Owner.

E. In the event the policy or policies are not renewed, 30 days prior written notice shall be given to the Owner.

F. All accidents or injuries to Contractor's employees working on the job site must be immediately reported to the Engineer (Professional).

G. The certificates to the above insurance policies shall be filed with the City Secretary within ten (10) days after notification of award of contract.

H. The Contractor shall also comply with all Federal, State, and Local laws and ordinances relating to Social Security, Unemployment Insurance, Pensions, etc., and shall pay all taxes, levies or assessments for which he may be liable.

8. Wage Rates and Subcontractors. The current wage rates as shown on the attached sheets
   A. (Attachment 3 to General Conditions) shall apply. It's mandatory that the Contractor and any subcontractor under him pay not less than the said specified rates to all laborers, workmen and mechanics employed by him in the execution of this contract, as specified in the Tex. Rev. Civ. Stat. Ann. art. 5159a.

   B. Contractor shall use due diligence in securing local subcontractors, vendors, and labor/craftsmen in performance of this agreement. Contractor shall submit to the Owner documentation of efforts in this regard prior to award of Contract.

   C. The Contractor and each subcontractor shall keep, or cause to be kept, an accurate record showing the names and occupations of all laborers, workmen and mechanics employed by him, in connection with this contract, and showing also the actual per diem wages paid to each of such workers, which record shall be open at all reasonable hours to the inspection of the City of League City, its officers and agents.

D. The Contractor shall pay, as a penalty, sixty dollars ($60.00) to the Owner for each calendar day, or portion thereof, for each laborer, workman or mechanic, who is paid less than the stipulated rate for any work done under this Contract.

E. The Contractor shall submit to the Owner documentation of compliance with the above items, on a periodic as requested basis.

9. Progress Schedule – The Contractor shall submit, in acceptable form, anticipated progress schedule covering work to be performed at the pre-construction conference. Schedule shall be updated periodically to reflect changes and must be submitted with the monthly pay estimate.

10. Use of Premises. The Contractor shall be required to restrict his efforts to the City's property and to the existing easements secured by the City. The Contractor, at his option and expense, may secure additional working easements from adjacent property owners, if desired.

A. If the Contractor utilizes any adjacent property for construction or storage, the Contractor will be required to submit an agreement letter from the property owner to the City for concurrence and shall also submit a release letter from property owners stating that the property has been satisfactorily restored. The release will be required prior to contract closeout.

B. If the Contractor utilizes or damages any property outside of the public right of way, the Contractor shall repair and restore the property to equal to or better than prior to construction. It is the Contractor's responsibility to make the repair to the satisfaction of the property owner. The Contractor is required to provide a release letter from the property owner after the repairs have been completed.

C. The project site(s) is/are located on an operating City street that services commercial and residential properties; therefore, public safety is of paramount importance.

D. The Contractor shall cover or enclose all open excavations, trenches, bore pits and other hazardous areas at all times when construction is not actually in progress.

E. Contractor shall promptly remedy any hazardous conditions existing on the project site, whether or not he has been directed to do so by the Engineer/Professional.

11. Record Drawings - Upon completion of the project, the Contractor shall furnish Owner with two sets of direct prints, marked with red pencil, to show as-built dimensions and locations of all work constructed. As a minimum, the final as-built drawings shall include the following:
    1. Horizontal and vertical locations of work.
    2. Changes in equipment and dimensions due to substitutions.
    3. "Nameplate" data on all installed equipment.
    4. Deletions, additions, and changes to scope of work.
    5. Any other changes made.

Record drawings are to be submitted with Contractor's Notice of Completion and are a condition of the Contractor's Notice of Completion.

12. Preservation of Trees and Shrubs. Trees and shrubs within the right-of-way shall not be removed or disturbed unless stated otherwise on the plans. Unless indicated in the Bid Proposal, any work required to provide tree protection, maintenance and evaluation will be considered incidental to the various pay items and no separate payment for this work will be made. Where tree roots must be cut, follow the repair method described in the "Technical Specifications". The contractor must utilize the services of a professional Arborist when such work is required.

13. Any areas of grass which are disturbed or dug up during the construction shall be replaced with St. Augustine sod, or, upon permission of the Engineer/Professional, grass which matches the grass removed, or as stated on plans.

14. When construction occurs in City right-of-ways, alleys and easements on residential yard areas, care shall be taken to minimize construction damage to yard areas. Contractor shall return all areas to a condition equal or better than prior to construction.

15. The Contractor shall be aware that utilities and pipelines (including but not limited to telephone, gas, petrochemical or petroleum product lines, cable, and electric) are present in the alleys, easements, and in the right-of-way. The potential of encountering these lines during excavation is very high. The Contractor shall coordinate with all the pertinent utility companies and schedule his work in such a manner that delays and interruptions of service do not occur. The Contractor will provide adequate protection to the utilities and pipelines as required or directed by the pertinent utility company's and include costs in the related bid items to work around the pertinent utilities and to complete the work.

16. The Contractor shall be aware that the location and depth of the existing utilities shown on the plans is based on information obtained from utility maps and information provided by others and has not been field verified. There is a potential for additional tie-ins to the existing utility that are not shown on the plans. The possibility of encasement (steel pipe, concrete pipe, stabilized sand, concrete) of the utility, and presence of manholes or structures not shown on plans exist. The potential for change in alignment due to additional manholes located in the field or potential for installing additional manholes on the existing main above and beyond those shown on plans exist. The Contractor shall coordinate verify all the above prior to commencing construction. The information provided will in no way relieve the Contractor of his responsibility of verification prior to construction.

17. Subsurface Utility Exploration - It is not represented that PLANS show all existing storm sewer, sanitary sewer, water, gas, telephone, petroleum or petroleum related pipelines and electrical facilities and other underground structures. It is the Contractor's responsibility to determine the depth, location and their existence which may conflict with the proposed construction by referring to available records, consulting appropriate municipal departments and utility owners and by making necessary exploration and excavations. All investigative work will be done and all repairs required after completion of investigative work shall be performed by the Contractor at no additional cost to the project.

A. Whenever existing utilities, not indicated on PLANS, present obstructions to grade and alignment of pipe, immediately notify Engineer and Owner, who without delay, will determine whenever existing utilities are to be relocated, or grade and alignment of proposed pipe changed. When necessary to move services, poles, guy wires, pipelines, or other obstructions, the Contractor shall contact and coordinate and make arrangements with owners of said utilities. Owner will not be liable for damages on account of delays due to changes or adjustments made by owners of privately owned utilities and faulty workmanship by owners of privately owned utilities which hinder progress of work regardless of work authorized by Owner or other entities.

B. It is the Contractor's responsibility to install the proposed water line and maintain proper clearances with all utilities and meet the regulatory requirements. Any damage to existing sprinklers or sanitary sewer service lines shall be repaired to Owner's satisfaction at no additional cost to the project.

18. In the event a utility (shown or not shown on plan drawings) including but not limited to gas, electric, telephone, cable, petroleum or petroleum related pipelines is exposed due to excavation and is in conflict, the appropriate company shall be contacted by the Contractor. The Contractor shall make a concerted effort to the Engineer's satisfaction to identify the utility (if unknown) and avoid any conflict with the utility. The Contractor shall provide all the necessary documentation for the efforts expended by the contractor in locating the utility. The documentation shall be either telephone conversation memos, letters, meetings on site and other coordination efforts performed to identify the utility or pipeline. In the event of a conflict with the utility, and the Engineer concurs that the Contractor had made a concerted effort to avoid the conflict, and in spite of his effort, the conflict cannot be avoided without the utility being relocated, the Owner will assist in coordinating the relocation efforts of the utility with the pertinent company. (The Contractor is still responsible for coordinating efforts with the utility or the pipeline company). The Contractor during the period the utility is being relocated, will move his crew(s) to other areas at his own expense. The Contractor will not be paid any compensation for delays or downtime resulting from the coordination and relocation efforts performed by the Contractor or the utility owner due to the utility conflict. The Contractor may request additional time if the relocation effort hinders his construction effort. No additional payment will be approved. If the Contractor chooses to assist the utility or pipeline company in the relocation effort, he shall be doing so at his own risk. The Owner will not be responsible for costs incurred by the Contractor from providing such assistance to the utility or pipeline companies.

19. The Contractor shall accomplish the proposed construction by hand excavation while working in close proximity to utilities, structures, landscaping, trees, shrubs, swimming pools, etc. and whenever necessary or as directed by the project representative. Any additional costs associated with utilizing hand excavation shall not be paid for separately and shall be included in the unit price bid for the related item.

20. The Contractor is made aware and shall make provisions in his unit price bid to allow for changes in alignment (vertical and horizontal) of the proposed water main during construction to avoid conflicts, field conditions, and to expedite construction. The Contractor is made aware that the proposed water main may be required to be installed at a greater depth

than originally anticipated to avoid conflicts and to maintain clearances with other utilities. No additional payment shall be made for any increased installation efforts expended by the Contractor. The Owner will not be responsible for any claims for additional costs resulting from increased level of effort resulting from the change in alignment. Any coordination or verification of existing utilities (including but not limited to gas, electric, water, sewer, petrochemical pipeline) resulting from the realignment shall not be paid for separately and shall be incidental to project costs. In the event the Contractor desires additional time due to the conflict, the Contractor shall submit documentation supporting such request to the Owner as per the project specifications. The Owner will review and evaluate such requests on a case by case basis.

21. Utility Services for Construction - Water necessary for construction will be available at no additional cost to Contractor. Contractor shall obtain a fire hydrant water meter from the Owner and shall monitor all water usage as metered. The Contractor may be required to draw water at specific locations as directed by the Owner. Contractor shall not use resident's water.

22. Interruption of Utility Services – Contractor shall not operate valves or other controls on existing systems. Exercise care in performing work so as not to interrupt service. Locate and uncover existing utilities ahead of heavy excavation equipment. At house connections, either lift trenching machine over lines or cut and reconnect with minimum interruption of service. In the event there is a need for interruption of water service, the Contractor shall contact the City in writing so that the City forces can operate the appropriate valves. The Contractor shall provide a minimum of 72 hours notice to property owners whose service will be interrupted.

23. Resident and Property Owner Notification. Once the work begins it shall be constructed and completed in the shortest time possible to minimize inconvenience to property owners. Contractor shall assure that all affected property owners are notified between 72 hours and 2 weeks before work begins on their street/alley/easement. The Contractor shall provide property owners the minimum following information; work to be performed, starting and ending dates, and name and number of City official to be contacted for questions. Written notices shall be approved by Engineer prior to distribution.

24. Driveway Disturbance. Residents and property owners shall be notified, by the Contractor, between 72 hours and 2 weeks in advance of disturbance of driveways. Notice to property owners shall follow the procedure as stated in the previous item. Driveways that are open cut shall be reconstructed as soon as possible to minimize inconvenience to the property owners. The materials used for the replacement of the driveways shall be as shown on the plans and in all cases shall be equal to or better than the existing material. In the event an excavation at a driveway must be left open over night, the excavation shall be covered and temporary access to the property shall be provided. Access shall be maintained to adjacent property at all times. Anchored steel sheeting, bridges, temporary driveway or other substantial structure shall be used to provide temporary access to the property.

25. All traffic control devices, placement and activities shall be as per the latest version of the Texas Manual on Uniform Traffic Control Devices (TXMUTCD). If there is any conflict

between the TXMUTCD and traffic control requirements with the Contract Documents, the Contractor shall notify the Engineer immediately.

26. Traffic During Construction. When construction begins on a street, the Contractor shall maintain traffic on the streets at all times. Contractor shall also make necessary provisions to allow ambulance, police, fire and other emergency vehicles access to the street.

    During construction, the Contractor shall allow resident traffic access to the street with proper guidance, direction, flagmen and traffic control and only at such times that damage will not occur to the new construction or to the vehicles.

27. Closing Streets to Traffic. The Contractor shall maintain traffic on the project streets throughout construction. In the event a Contractor must close a street to all traffic, he shall obtain prior permission from the City Engineering Department and he shall provide a minimum of 72 hours' notice in writing to the following: the Engineer, City's Engineering Department, City's Fire Department, and City's Police Department.

    A. The Contractor shall schedule and conduct his operations in the intersections as rapidly as possible to minimize the length of time the intersections will be closed to traffic.

    B. Whenever a portion of a street is closed to traffic, the Contractor shall verify that alternate access is available for residents and property owners on that street or for residents and property owners desiring to access crossing streets. Appropriate detour signage shall be provided to clearly indicate detours, as per the Texas Manual on Uniform Traffic Control Devices.

    C. Contractor shall maintain cross street traffic at other intersecting streets at appropriate times during the construction to facilitate local access as approved and coordinated with the Owner.

    D. When the Contractor must close a roadway, 72-hour advance notice must be given to the City and the Engineer. All materials incorporated into the work pertaining to the road closure, must be on the jobsite 24-hours in advance of the road closure for inspection. All barricading and construction signage shall be in accordance with the Texas Manual on Uniform Traffic Control Devices for Streets and Highways.

    E. The Contractor shall provide the Engineer and Owner for authorization a schedule and plan of anticipated road blockages, alternative access and detours prior to implementing said schedule and plan.

28. Warning Signs and Barricades. When any street or any section of a street is closed, the Contractor shall furnish and maintain adequate barricades, warning and directing signs, red flags and lights at the end of each street and at all intersections along the street within the limits of the work. All expenses incurred for the above requirements shall be borne by the Contractor. All warning signs and barricades shall be in conformance with the Texas Manual of Uniform Traffic Control Devices latest edition.

29. Work to protect items to remain by installation of temporary construction, including posting of warning signs, placement of protective fencing, barriers, barricades and covers, and restoration of damaged items to remain, will be considered incidental to the various pay items and no separate payment for this work will be made.

30. Excavated Material and Storage of Equipment and Materials. No equipment, material or excavated material shall be stored or deposited on streets, lawns, driveways, sidewalks, gardening or shrubbery.

31. Work necessary to haul materials from original positions to points of disposition, including excavation of earth materials and utilization in construction or other disposition, will be considered incidental to the various pay items and no separate payment for this work will be made.

32. Construction materials storage facility site shall comply with applicable City of League City requirements and meet the following minimum requirements:

    A. Provide storage facility of neat and reasonable uniform appearance, structurally adequate for required purpose.

    B. Maintain during entire construction period.

    C. Prior to start of work, install enclosure fence with locked entrance gate.

    D. Provide an all-weather surface with adequate drainage to City facilities. Do not drain onto adjacent property.

    E. Clean mud and debris from City streets on a daily basis or more often as required. Construction operations may be temporarily suspended if the storage facility is not properly maintained.

33. Barricading Excavation Areas. All excavation areas shall be barricaded at all times to prevent motorists from inadvertently driving into bore pits, open cuts, and trenches. All excavation must also be cordoned off with 4-foot high orange polyethylene fence with mesh size 2.5" by 0.80", Tenax Beacon or approved equal, installed as per manufacturer's recommendations and acceptable to the City of League City. The fence shall be supported with enough intermediate support to avoid excessive sagging. Adequate barricades with flashing yellow lights shall also be provided to protect pedestrian traffic and vehicular traffic.

    A. No excavations shall be left open overnight.

    B. All excavations which cannot be back filled overnight for the installation of manholes, storm and sanitary sewers, and utilities shall be covered with anchored steel sheeting, in paved areas, and 3/4" plywood, wood planking or some other material approved by the City in non-paved areas. The steel sheeting shall be of sufficient thickness to support H-20 loading, truck or lane that produces maximum stress. The excavation area must be well protected with traffic barricades equipped with flashing yellow lights.

C. It is the Contractor's responsibility to insure the safety of the public, himself, his employees and all other persons. Provisions listed here are minimum measures and in no way relieves the Contractor of his responsibility or changes or alters other requirements within these contract documents.

D. The Contractor is hereby made aware that the work is being conducted in an area consisting of a high amount of pedestrian and vehicular traffic. The possibility of vandalism to his barricades, sheeting, tape, other protective devices and equipment does exist. The Contractor is responsible for maintaining all traffic barricades, sheeting, tape and other protective devices during construction hours and non-construction hours such as weekends, holidays, nights and inclement weather periods. Upon notification of the need for maintenance of the barricaded areas, either by the Contractor's own personnel, the City or its representatives, the Contractor shall promptly take the required corrective measures.

34. Replacement of Damage. If any damage is done to existing asphalt or concrete roads or appurtenances, by equipment, tires, metal tracks or other construction practices, damage shall be saw cut, removed and replaced with materials equal to or superior to the existing material. Damage shall include but not limited to scrapes and tread marks. Repair of damaged areas will be at the Contractor's expense.

35. Damage to pavement, curbs, driveways, sidewalks or any other structure caused by the Contractor during construction shall be repaired at the Contractor's expense.

36. Construction Sequence. It is important to the Owner that this project be accomplished in the most expedient manner possible.

37. The Contractor shall schedule his work such that each section will be substantially complete prior to moving his construction operation to another section. More than one section can be under construction at one time, only if each section has continuous, active, and uninterrupted construction operation and approved by the City.

38. The nature of this project is such that there are different sections along the project alignment where construction may occur. The Contractor shall not leave one construction section to begin work on another site unless:

A. The work on the section, in the Owner's opinion, is complete to the point where the Contractor can move to the next section.

B. The Contractor will maintain an active on-going construction effort on each section to a completion point which the Owner feels is adequate; and the Owner concurs that an active on-going construction effort is being maintained.

C. The Contractor has adequate forces to work multiple sections to the Owner's satisfaction; and the Owner concurs with the Contractor that adequate forces are available.

D. The Contractor has obtained concurrence from the Owner that work can begin on another section.

It is the Owner's desire not to have multiple partially completed sections on which minimal work is being performed. It is the Owner's desire not to have multiple sections on which cleanup is remaining to be performed.

It is the Owner's desire that each section be completed to the point where the installation is complete, testing is complete, cleanup is complete and grass or appropriate surface material has been installed prior to the Contractor moving to another section. If the Contractor desires to work multiple sections along the project alignment at any one time, then he shall provide adequate manpower on each section to maintain a continuous, active, on-going work effort on each section and obtain prior approval from Owner.

39. Other Contracts - Other construction may be underway concurrently in this area. Afford utility companies and other Contractors reasonable opportunity for introduction and storage of their materials and execution of their work. All work under this Contract must be properly connected and coordinated with that constructed by others. The City is not responsible or liable for any claims resulting from delays by other Contractors or utility companies in the area regardless of the entity authorizing such work and any faulty workmanship resulting from such work performed.

40. Alternate Designs - If alternate design features are proposed for convenience of Contractor, submit design calculations and detail drawings covering proposed changes and related modifications of Contract PLANS to Engineer for review. Make drawings same size as Contract PLANS and of comparable quality. Make payment of charges resulting from modifications, including engineering charges for checking such designs.

41. Cleanup. Remove from site of work, and from public and private property, temporary structures, rubbish, and waste materials including excess excavated materials. Dispose of surplus earth as directed or as specified. Complete cleanup not greater than 800 feet behind operation. The operation may be suspended by the Owner's Representative temporarily if complete cleanup is further behind than 800 feet. Contractor is to be aware that the cleanup procedure will be strictly enforced by the Owner. There will be no extra pay for complying to said item.

    Complete cleanup of a site shall be mandatory before the Contractor can begin work on another site. Multiple sites can be worked on simultaneously, however, complete cleanup must be conducted before a work crew leaves one site to work on another site.

42. Some manholes or valve structures may have been paved over or otherwise covered up, may not be existing, or may not be correctly shown in the plans. The cost to field locate and open the manhole, valve, or other structures shall be incidental to the work specified.

    If requested by the Contractor, the Owner will make a concerted effort to provide any available layout maps of the existing utilities, but the Owner does not guarantee the accuracy

of such information. The information provided will in no way relieve the Contractor of his responsibility of verification prior to construction.

43. Incidental Construction Items. All items called out on the construction drawings or within the specifications which are not itemized in the bid proposal section of these documents shall be considered incidental to the cost of the project.

44. Any increased width of pavement, driveway, curb reconstruction or sidewalk repairs from that shown on the plans required due to over excavation, undermining (due to improper shoring) or for Contractor convenience shall be incidental to the cost of the item requiring excavation.

45. All testing equipment shall be calibrated at maximum twelve month intervals and after any repairs or adjustments by devices of accuracy traceable to either National Bureau of Standards or accepted values of natural physical constants. The Contractor shall provide a written certification to the Engineer/Professional on the calibration.

46. Repairs to curbs, driveways, roadways and sidewalks shall be constructed with materials consistent with the existing and adjacent material and according to the detail shown in the plans as a minimum. All curbs, sidewalks, roadways and driveways to be removed and replaced shall be saw cut (a straight, even, clean cut) at the point of removal so that an even joint results between existing pavement and new pavement. Jointing material shall be placed between the new and existing material.

47. The Contractor is made aware of rainfall events that may impact the construction efforts regardless of where the rainfall occurs, whether upstream or downstream of the project. The Contractor's construction operation shall not impede the drainage flow and shall maintain drainage at all times. The Contractor is responsible for the installation and removal of temporary pipes, pumps and/or structures or any other means as necessary to maintain drainage during construction operations. The Contractor shall take all necessary measures to provide a safe condition during the construction operations to protect his workers, machinery and property. No separate payment shall be made for maintaining drainage.

48. The Contractor is responsible for the verification of all key design elevations prior to commencing construction. Yard swales and pipe drains disturbed during construction shall be repaired or replaced with positive drainage towards the street or other existing drainage structure or swale at no additional cost to the Owner.

49. <u>Tack Coat</u> - During the time period from April 15th to October 16th, of each year, asphaltic material used for tack coat shall be either SS-1, anionic slow setting emulsion or CSS-1, cationic slow setting emulsion. During the remainder of the year, the asphaltic material shall be either RC-250 or RC-2, rapid curing cutback asphalt.

50. The Contractor shall carry out his operations in strict accordance with all applicable Occupational Safety and Health Administration (OSHA) standards. Special attention is drawn to those safety requirements involving work on all elevated platforms and entry into a confined space. It shall be the Contractor's responsibility to familiarize himself with OSHA

standards and regulations pertaining to all aspects of the work. All work shall be done in accordance with OSHA, Safety and Health Regulations of the United States Government for Construction, State of Texas laws and regulations, Galveston County regulations and City ordinances. Contractor shall provide documentation that confirm there is personnel onsite with knowledge of safety steps that need to be taken for entering a confined space. No work in a confined space shall be allowed until the Contractor has proven competency for this type of work and measures have been taken to provide full safety for workers. The City of League City requires that any person that enters a confined space be certified for confined space entry.

51. The Contractor shall replace or repair pavement, sidewalks, driveways, culverts, inlets, curbs, gutters, shrubbery, trees, fences, sod and other like obstructions removed or disturbed to a condition equivalent to or better than existing condition. In the event sod is removed or disturbed it will be replaced to a healthy green condition, regardless of the condition of the existing sod.

52. The Contractor will have his representative available on the project site 24 hours/day during the duration of any wastewater diversion pumping. No separate payment shall be made for diversion pumping efforts and the cost expended must be included in the unit price for related items. The Contractor is responsible for maintaining additional standby pumps in the event of failure of any pumps.

53. Contractor shall be aware that groundwater is present in the construction sites. Seepage into excavation may occur. This seepage should be collected in sumps and pumped out (sumping). This type of de-watering is considered incidental to the cost of the improvement.

    A. If seepage cannot be handled by sumping, then mechanical dewatering techniques such as well pointing shall be used.

    B. <u>Piezometers</u> - Since ground water conditions can change depending on current conditions, the Contractor shall install piezometers at areas where dewatering is considered and groundwater level and seepage conditions should be checked prior to construction. The Contractor shall utilize the services of a geotechnical engineering firm to install the piezometers and report on the groundwater conditions. The installation of piezometers in advance of the excavation can give the Contractor advance notice for the need to well point and will therefore aid the Contractor in his scheduling efforts. If it is determined that well pointing is required, then the cost of the piezometer will be incidental to the well pointing.

54. Soils stratigraphy and groundwater conditions encountered during excavations may vary from those observed in the geotechnical investigation report provided in this specification. The Contractor should collect additional subsurface information as he deems necessary to determine the conditions of the site. If conditions significantly differ from those presented in the geotechnical report attached to these specifications, the Contractor shall notify the Owner and Engineer immediately.

55. The Contractor shall monitor all excavations and retaining structures on a continuous basis by experienced personnel who can make evaluations as to the appropriateness of the retention system used.

56. The Contractor shall comply with Texas Worker's Compensation Commission Rule 28 TAC§110.110 relating to Reporting Requirements for Building or Construction Projects for Governmental Entities.

57. Dewatering - Contractor shall maintain dewatering after any in-trench cement stabilized sand bedding and backfill has been installed so that a good set on the cement has been obtained. Do not remove well points immediately after placement of cement stabilized sand. The dewatering shall remain a minimum of 48 hours after placement of the cement stabilized sand bedding and/or backfill. The Contractor shall obtain site representative concurrence prior to the removal of dewatering.

58. Trench Safety - Contractor shall be aware that conditions may exist whereby solid sheeting and shoring may be more appropriate than trench boxes.

    The Contractor shall provide an excavation safety system as approved by OSHA 29 CFR Part 1926 (latest revision) indicating the use of sheeting, shoring, bracing, under pinning, etc., to be utilized where conditions warrant such system. This system shall be provided in addition to other excavation systems the Contractor selects as per section 01526 "Trench Safety System".

59. Permanent timber trench safety is intended to be used when wet sand is encountered and is not able to be controlled by standard trench safety. This Bid Item (when provided) is not intended to be used as standard trench safety. In locations of wet sand trench conditions where permanent timber trench safety is used, and a separate bid item is provided, it will be paid for in lieu of standard trench safety and not in addition to. Permanent timber trench safety used at other locations will be paid for as standard trench safety.

60. All claims for extension of time shall be made in writing to the Owner no more than ten days after the occurrence of the delay or after the cause of the delay has become apparent; otherwise they shall be considered waived. In the case of the continuing cause of delay, only one claim is necessary. Any request for an extension of time shall be accompanied by a revised construction schedule which, if approved by the Owner, shall become the Contractor's construction schedule.

    When the Contract is on a calendar day basis, no extension of time shall be allowed for adverse weather conditions reasonably anticipatable from historical weather data, and such weather conditions shall not be deemed a casualty beyond the Contractor's control. The Contractor may be granted an extension of time because of unusual inclement weather which is beyond the normal weather recorded.

61. Dust Control - The Contractor shall take necessary measures to control dust on the site and minimize blowing dust. The Contractor shall water the site as necessary and when requested by the Owner to control blowing dust. The site shall be watered to the Owner's satisfaction.

62. Traffic Officer Required. Unless otherwise specified, off-duty uniformed police officer shall be used for the regulation of traffic at the following locations:

    A. Where multi-lane vehicular traffic must be diverted into single-lane vehicular traffic.

    B. Where vehicular traffic must change lanes abruptly.

    C. Where construction equipment either enters or crosses vehicular traffic lanes and walks.

    D. Where construction equipment may intermittently encroach on vehicular traffic lanes and unprotected walks and cross-walks.

    E. Where construction activities might affect public safety and convenience.

    F. Where traffic regulation is needed due to rerouting of vehicular traffic around the work site.

    G. The use of flagmen is for the purpose of assisting in the regulation of traffic flow and movement, and does not in any way relieve the Contractor of full responsibility for taking such other steps and provide such other flaggers or personnel as the Contractor may deem necessary to protect the work and the public, and does not in any way relieve the Contractor of his responsibility for any damage for which he would otherwise be liable.

    H. Flaggers shall be used and maintained, at such points, for such periods of time, as may be required to provide for the public safety and convenience of travel. Flaggers, and their use, shall conform to Item 7, Article 7.7 of the TxDOT Standard Specifications.

    I. No separate payment will be made for uniformed traffic officers and/or flaggers. Such services as outlined in this item are incidental to the cost of the project.

63. Certified flagmen may be used on the project. However, there may be conditions that would warrant uniformed officers for traffic control. The Contractor is responsible for identifying such conditions and situations, and must utilize uniformed officers. The Contractor is responsible for maintaining safe traffic control at the job site at all times. The Contractor must utilize uniformed officers for traffic control, in TxDOT right of way, school vicinity, major thoroughfares and other areas designated by the City at no additional cost to the project. Uniformed peace officers shall be off-duty League City police officers as a first priority, and then other Galveston County peace officers as a second option. In the event League City policemen or Galveston County peace officers are available, the Contractor shall provide documentation and justification for the use of other peace officers. The City reserves the right to request the Contractor to utilize uniformed officers at any location throughout the project.

    A certified flagman must be formally trained in traffic control procedures. Certified flagmen must wear bright-colored vest and be equipped with appropriate flagging and communication devices while on the work site. They must also have in their possession while on duty a proof of training identification issued by a certified institute.

64. The Contractor shall provide a minimum of 72 hours notice in writing to the Owner and the Engineer and the project's on-site representative of any testing. The Contractor shall document the test results and provide a copy to the Owner and the Engineer. All testing procedures shall conform to the specifications and standards of the Owner. The Contractor shall keep in daily contact with the on-site representative through completion of the project and shall have a superintendent on the job site who can communicate in English with the on-site representative at all times.

65. The Contractor is responsible for locating the existing water lines, including valves prior to construction. The Contractor shall provide a minimum of one week's notice in writing to the City for assistance in operating the valves in the system. The Contractor shall be aware there are water lines with no existing valves present for isolating the line. The Contractor is responsible for making the tie-ins (wet connections) under pressure in those areas. The Contractor shall be paid at the bid unit price for wet connection. No additional payment shall be made performing such work under unfavorable conditions or increased level of effort resulting from such conditions.

66. The locations of the proposed fire hydrants shown on plans are approximate. The Contractor shall field verify the locations with the Owner's representative and the Engineer/Professional prior to installation. In the event the Contractor fails to obtain concurrence with the Owner's representative or the Engineer regarding the locations, the Contractor shall relocate the said fire hydrants to the locations determined by the Owner at no cost to the project.

67. The Contractor shall remove and replace fence sections as necessary to accomplish the construction at no additional cost to the Project. In the event of damage to fences or other improvements, structures, plants, landscaping, etc. due to Contractor's performance of work, the Contractor will replace them with equal or better product, to Owner's satisfaction, all at no additional cost to the Project.

68. The Contractor shall be aware that the work may be performed in areas that are in close proximity to structures (power poles, buildings, pipelines, and other structures). The Contractor shall take all precautions necessary to protect such structures from damage and insure safety to his personnel during construction. Any damages resulting from the Contractor's operations to such structures shall be repaired at no additional cost to the project.

    In the event the Contractor determines that some structures conflict with the proposed improvements, the Contractor shall provide a written notice to the City documenting the location of such structure. The City will coordinate with the pertinent Owner and try to expedite the relocation efforts. However, the City does not guarantee the time of relocation efforts.

69. The Contractor is responsible for addressing all complaints from citizens and commercial property owners caused due to the performance of his work. The Contractor shall take appropriate measures to address all complaints from the citizen and commercial property owner's to their satisfaction in a timely manner. The Contractor shall submit to the Engineer/Professional a letter from the citizen or commercial property owner acknowledging

the complaints have been addressed and any repair work necessary work has been completed by the Contractor.

70. The Contractor shall have a supervisor present on the site at all times when on-site activities relating to the Work are occurring, except for periods of absence approved by the Engineer/Professional or the Owner when: (i) the supervisor's absence from the site is caused by compelling or emergency circumstances, and (ii) the Contractor makes suitable provisions for substitute supervision. The Contractor shall notify the Owner and the Engineer/Professional as soon as the need for an absence is known. Approvals of absences will not be unreasonably withheld.

    If the Engineer/Professional and the Owner jointly notify the Contractor that the current supervisor should be replaced for good cause, the Contractor will replace the supervisor as soon as practicable, and in any event within ten days (or such other time period as may be approved by the Engineer/Professional and Owner). For this purpose, "good cause" means: (i) the supervisor is not causing the Work to be performed in accordance with the Contract Documents, (ii) the supervisor is not communicating effectively with the Owner, the Engineer/Professional or other persons affected by the Work, or (iii) the supervisor is failing to prevent (or remedy) needless dislocation, damage or inconvenience related to the work.

71. The Contractor is made aware that the bid quantities shown in the bid proposal are approximate and may change. No additional payment shall be made for increase and/or decrease in bid quantities. The City reserves the right to make adjustments (tie-in at different locations or extend utility line limits) in the field. Payment for performing the work shall be made at the established bid unit price in the contract.

72. As part of the Contract Closeout, prior to release of the contract retainage, the Contractor shall provide the following:

    A. Agreement of Final Payment and CONTRACTOR'S Sworn Release
    B. Subcontractor/ Materialman's Full and Final Release and Waiver of Claims and Liens
    C. Consent of Surety to Final Payment- Either AIA Document G707, or Surety Standard Form
    D. One Year Maintenance Bond
    E. Record Drawings (including service reconnection locations)

73. Negotiation or changes to unit prices due to material/labor price increases will not be allowed for duration of this project. The bid unit prices of the successful bidder for the project shall govern regardless of the magnitude of price decrease or increase in material costs during the project duration.

74. The Contractor is made aware that trucks carrying all excavated materials/spoils shall utilize a designated route approved by the City. Such routes will be provided by the City at the pre-construction conference.

75. Bidder shall have full responsibility for interpretation of the soils bore log information and use of the information for his bidding and construction purposes. Bidder may perform soils

investigation as they deem appropriate. In the event the Bidder desires to perform his own geotechnical investigation along the project areas, he must notify the City and obtain approval prior to proceeding with such investigations. The bidder is also responsible for contacting One Call prior to commencing any work. Any damages to the City or private utilities is the Bidders responsibility.

76. The Contractor is responsible for contacting and coordinating with TXDOT for obtaining a construction permit for performing improvements in TxDOT right of way. As part of the permit application process, TxDOT will require the Contractor to submit a detailed traffic control plan signed and sealed by a Licensed Engineer in the State of Texas. The traffic control plan included in the plan drawings is being provided as a general guide and cannot be submitted by the Contractor to TxDOT for obtaining the construction permit. The Contractor is made aware that TXDOT may require the Contractor to install additional signage, barricades, message boards (notice to public of the impending work), arrow boards, employment of uniformed officers for traffic control, safety lighting & illumination of work area, work after hours (night), work weekend (day or night) to facilitate smooth flow of traffic during construction. No additional payment shall be made for traffic control and regulation including but not limited to preparation and submittal of traffic control plan to TxDOT, permit coordination, changes directed to traffic control plan and items stated above.

77. The Contractor is made aware that portions of work on this project (including TxDOT) may be required to be performed after hours due to traffic restrictions and special situations. No additional payment shall be made for work performed after normal hours. The Contractor is responsible for having all equipment, materials, lighting and appurtenances necessary for performing the work after hours.

78. The Contractor must make a concerted effort to complete the construction operations during the normal working hours in areas that are not within TxDOT right-of-way or area that require the work to be performed after normal working hours. In the event, the Contractor foresees work extending beyond the normal working hours, the Contractor must provide adequate notice to the City and the Engineer. The Contractor is responsible for notifying all businesses and residents impacted by the Contractor's for having adequate signage, manpower, safety devices including but not limited to lighting for performing rehabilitation operations after normal working hours. The same shall apply if TxDOT requires the work to be performed after hours or on weekends (No Separate Pay).

79. The Contractor is responsible for cleanup of all areas using a mechanical sweeper at least twice a week or as directed by the Owner at no additional cost to the project.

80. All excavated material/spoil must be placed on plywood and hauled off at the end of the day. Under no circumstances will placement of excavated/spoil material be allowed on bare earth or on pavement. No separate payment shall be made for the efforts and the cost must be included in the unit price bid for the related work.

81. The Contractor is made aware that any produced discharges, such as groundwater, chlorinated flush water, and wastewater from the work performed in TxDOT R.O.W. will need to be discharged into the City's storm system or wastewater collection system as

approved by the City. The Contractor will not be allowed to discharge any produced discharges into TxDOT R.O.W. without obtaining a signed agreement from TxDOT. The Contractor will obtain all required permits from TxDOT at no additional cost to the project. For additional details on the separate signed agreement please contact Tricia Collette (713) 802-5568.

82. **Prohibition on Boycotting Israel:** Pursuant to Section 2270.002, Texas Government Code, by executing this Agreement Contractor verifies that Contractor: (1) does not boycott Israel; and (2) will not boycott Israel during the term of this Agreement.

83. **Prohibition Against Business with Iran, Sudan or Foreign Terrorists Organizations:** Contractor warrants, covenants, and represents that Contractor is not engaged in business with Iran, Sudan, or any company identified on the list referenced in Section 2252.152, Texas Government Code

END OF SECTION

FINAL PAY ESTIMATE

19-CIP-043

Hometown Heroes Park Restrooms Project

CONTRACTOR NAME

- ☐ Consent of Surety.
- ☐ Certificate of Completion / Occupancy
- ☐ Affidavit of Bills Paid.
- ☐ Copies of all manufacturers O & M manuals and warranties.
- ☐ Record Drawings
- ☐ Final pay estimate that states “FINAL” invoice on it.
- ☐ One-Year Maintenance Bond

Project Manager Approval: _____

Date: _____

SECTION 01 1000 - SUMMARY

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.

1.2 SUMMARY

A. Section Includes:

1. Project information.
2. Work covered by Contract Documents.
3. Work by Owner.
4. Phased construction.
5. Work under separate contracts.
6. Purchase contracts.
7. Owner furnished products.
8. Contractor furnished, owner installed products.
9. Access to site.
10. Coordination with occupants.
11. Work restrictions.
12. Specification and drawing conventions.
13. Miscellaneous provisions.

B. Related Requirements:

1. Division 01 Section "Temporary Facilities and Controls" for limitations and procedures governing temporary use of Owner's facilities.

1.3 PROJECT IDENTIFICATION

A. Project Identification: Hometown Heroes Park Restrooms

1. Project Number: ZCA 1108801

2. Project Location: 1001 East League City parkway, League City, Texas 77573.

B. Owner: City of League City at the following location:

1. 300 W. Walker Street, League City, Texas 77573.

C. Architect: Ziegler Cooper Architects, 700 Louisiana, Street, Suite 350, Houston, Texas 77002.

1. Architect's Consultants: The Architect has retained the following design professionals who have prepared designated portions of the Contract Documents:

   a. Civil Engineering: Daniel Scott Engineering, LLC., 19701 Morris Street, Manvel, Texas 77578
   b. MEP Engineering: Wright Engineering Services, 9894 Bissonnet, Suite 340, Houston, Texas 77036.
   c. Structural Engineering: Schmitz Partners Engineers PLLC, 2825 Wilcrest, Suite 415, Houston, Texas 77042.

D. Construction Manager: To be determined.

E. Electronic Project Management (ePM) System: An Electronic Project Management system administered by Architect will be used for purposes of managing communication and documents during the construction stage.

1. See Section 013100 "Project Management and Coordination." for requirements for administering and using the Electronic Project Management.

1.4 WORK COVERED BY CONTRACT DOCUMENTS

A. The Work of Project is defined by the Contract Documents and consists of the following:

1. This project will consist of a 1,184 gross square foot, one-story restroom and storage facility for the city park. The building will have load-bearing CMU masonry walls with brick masonry veneer. The roof will consist of prefabricated wood trusses, wood decking and a sheet metal roof assembly.
2. The intent of these documents is to provide a waterproof building envelope. The General Contractor shall provide and install all necessary materials and systems as required to achieve this intent in his Base Bid price. The General Contractor and all Subcontractors involved in constructing the building envelope shall provide a minimum 2 year labor and material warranty covering all costs associated with repairing and/or replacing all defective materials and systems. Should any leakage or other forms of moisture infiltration occur into the building as the result of faulty or deficient construction, the General Contractor shall correct all defects without cost to Owner. All remaining work shall be warranted for a minimum one year as noted in the General Conditions of the Contract.

1.6 TYPE OF CONTRACT

A. Project will be constructed under a single prime contract.

1.7 EXISTING CONDITIONS

A. Contractor: Responsible to determine existing conditions on Project site by examination, whether shown on Drawings or not.

B. In addition to demolition which may be specified in other Sections and that which may be specifically shown on Drawings, cut, move or remove items as necessary to allow Work to proceed. Provide such items as:

1. Repair or removal of unsafe or unsanitary conditions.
2. Removal of abandoned items and items serving no useful purpose, such as abandoned piping, conduit, wiring and electrical devices.
3. Removal of unsuitable or extraneous materials such as abandoned furnishings and equipment, and debris such as rotten wood, rusted metals and deteriorated concrete.
4. Cleaning of surfaces and removal of surface finishes as needed to install new work and finishes.

1.8 WORK UNDER OTHER CONTRACTS

A. Provide items shown in Contract Documents unless specifically shown in Contract Documents as excluded from Work.

B. General: Cooperate fully with separate contractors if required so work on those contracts may be carried out smoothly, without interfering with or delaying work under this Contract. Coordinate the Work of this Contract with work performed under separate contracts.

1.9 ACCESS TO SITE

A. General: Contractor shall have full use of site for construction operations during construction period. Contractor's use of site is limited only by District's right to perform work or to retain other contractors on portions of Project.

1. Contractor Parking: Vehicle parking for Contractor and construction personnel shall be the responsibility of the Contractor.

B. Use of Site: Limit use of site to areas within the Contract limits indicated. Do not disturb portions of Project site beyond areas in which the Work is indicated. Site has very limited lay down area.

1. Driveways and Entrances: Keep driveways, loading areas, and entrances serving premises clear and available to city employees, the public, and emergency vehicles at all times. Do not use these areas for parking or storage of materials.

a. Schedule deliveries to minimize use of driveways and entrances.
b. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.

1.10 SPECIFICATION AND DRAWING CONVENTIONS

C. Division 01 General Requirements: Requirements of Sections in Division 01 apply to the Work of all Sections in the Specifications.

D. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:

1. Imperative mood and streamlined language are generally used in the Specifications. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.

2. Specification requirements are to be performed by Contractor unless specifically stated otherwise.

C. Specification Format: The Specifications are organized into Divisions and Sections using the 50-division format and CSI/CSC's "MasterFormat" numbering system.

1. Section Identification: The Specifications use Section numbers and titles to help cross-referencing in the Contract Documents. Sections in the Project Manual are in numeric sequence; however, the sequence is incomplete because all available Section numbers are not used. Consult the table of contents at the beginning of the Project Manual to determine numbers and names of Sections in the Contract Documents.

D. Drawing Coordination: Requirements for materials and products identified on Drawings are described in detail in the Specifications. One or more of the following are used on Drawings to identify materials and products:

1. Terminology: Materials and products are identified by the typical generic terms used in the individual Specifications Sections.
2. Abbreviations: Materials and products are identified by abbreviations published as part of the U.S. National CAD Standard and scheduled on Drawings.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 1000

SECTION 012100 – ALLOWANCES

PART 1 -

PART 2 - GENERAL

2.1 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.

2.2 SUMMARY

A. Section includes administrative and procedural requirements governing allowances.

B. Types of allowances include the following:

1. Lump-sum allowances.

2.3 DEFINITIONS

A. Allowance is a quantity of work or dollar amount established in lieu of additional requirements, used to defer selection of actual materials and equipment to a later date when direction will be provided to Contractor. If necessary, additional requirements will be issued by Change Order.

2.4 SELECTION AND PURCHASE

A. At the earliest practical date after award of the Contract, advise Architect of the date when final selection, or purchase and delivery, of each product or system described by an allowance must be completed by the Owner to avoid delaying the Work.

B. At Architect's request, obtain proposals for each allowance for use in making final selections. Include recommendations that are relevant to performing the Work.

C. Purchase products and systems selected by Architect from the designated supplier.

2.5 ACTION SUBMITTALS

A. Submit proposals for purchase of products or systems included in allowances in the form specified for Change Orders.

2.6 INFORMATIONAL SUBMITTALS

A. Submit invoices or delivery slips to show actual quantities of materials delivered to the site for use in fulfillment of each allowance.

B. Submit time sheets and other documentation to show labor time and cost for installation of allowance items that include installation as part of the allowance.

C. Coordinate and process submittals for allowance items in same manner as for other portions of the Work.

2.7 LUMP-SUM ALLOWANCES

A. Allowance shall include cost to Contractor of specific products and materials ordered by Owner or selected by Architect under allowance and shall include freight**,** and delivery to Project site.

B. Unless otherwise indicated, Contractor's costs for receiving and handling at Project site, labor, installation, overhead and profit, and similar costs related to products and materials ordered by Owner or selected by Architect under allowance shall be included as part of the Contract Sum and not part of the allowance.

C. Unused Materials: Return unused materials purchased under an allowance to manufacturer or supplier for credit to Owner, after installation has been completed and accepted.

1. If requested by Architect, retain and prepare unused material for storage by Owner. Deliver unused material to Owner's storage space as directed.

2.8 ADJUSTMENT OF ALLOWANCES

A. Allowance Adjustment: To adjust allowance amounts, prepare a Change Order proposal based on the difference between purchase amount and the allowance, multiplied by final measurement of work-in-place where applicable. If applicable, include reasonable allowances for cutting losses, tolerances, mixing wastes, normal product imperfections, and similar margins.

1. Include installation costs in purchase amount only where indicated as part of the allowance.
2. If requested, prepare explanation and documentation to substantiate distribution of overhead costs and other markups.
3. Owner reserves the right to establish the quantity of work-in-place by independent quantity survey, measure, or count.

B. Submit claims for increased costs because of a change in scope or nature of the allowance described in the Contract Documents, whether for the purchase order amount or Contractor's handling, labor, installation, overhead, and profit.

1. Do not include Contractor's or subcontractor's indirect expense in the Change Order cost amount unless it is clearly shown that the nature or extent of Work has changed from what could have been foreseen from information in the Contract Documents.

2. No change to Contractor's indirect expense is permitted for selection of higher- or lower-priced materials or systems of the same scope and nature as originally indicated.

PART 3 - PRODUCTS (Not Used)

PART 4 - EXECUTION

4.1 EXAMINATION

A. Examine products covered by an allowance promptly on delivery for damage or defects. Return damaged or defective products to manufacturer for replacement.

4.2 PREPARATION

A. Coordinate materials and their installation for each allowance with related materials and installations to ensure that each allowance item is completely integrated and interfaced with related work.

4.3 SCHEDULE OF LUMP-SUM ALLOWANCES

A. General Contingency: $10,000

B. Interior and Exterior Bldg. Signage: $2,000

END OF SECTION 012100

SECTION 012516 – SUBSTITUTION REQUEST FORM

Project: Hometown Heroes Park Restrooms

Project No. 1108801

From:_____

A. Bidders hereby requests acceptance of the following product or system as a substitution in accordance with provisions of the Instructions to Bidders and Section 01 60 00 of the specifications:

B. SPECIFIED PRODUCT OR SYSTEM
   1. Substitution request for:_____
   2. Specification Section No.:_____ Article:_____

C. SUPPORTING DATA
   1. Product data for proposed substitution **and the originally specified product data** is attached (description of product, reference standards, performance and test data).
   2. Sample is attached. Yes No
   3. Sample will be sent if requested.
   4. Contractor shall include all costs for detailing revisions of all adjacent material systems in their price due to any changes required by the substitute product. Details shall be submitted as CAD drawings and included in shop drawings and project close-out documents.

D. QUALITY COMPARISON
   1. SPECIFIED PRODUCT SUBSTITUTION
      a. Name Brand:_____ _____
      b. Catalog No._____ _____
      c. Manufacturer:_____ _____
      d. Vendor:_____ _____
      e. Variations:_____ _____
      f. (Add additional sheets if necessary)
      g. Maintenance Service Available: Yes No
      h. Spare Parts Source: _____
      i. Warranty: Yes No _____Years.

E. PREVIOUS INSTALLATIONS
   1. Identification of similar projects on which proposed substitution was used:
   2. Project:_____ Project:_____
   3. Address:_____ Address:_____
   4. Architect_____ Architect_____
   5. Owner_____ Owner_____
   6. Date Installed_____ Date Installed_____

F. REASON FOR NOT GIVING PRIORITY TO SPECIFIED ITEM
   1. _____
   2. _____

G. EFFECT OF SUBSTITUTION
   1. Proposed substitution affects other work or trades: NO Yes (If yes, explain) _____
   2. _____
   3. Substitutions requires dimensional revisions or redesign of structural, M/E/P, or other work: No Yes (if yes, attach data and shop drawings explaining and depicting revisions. Contractor shall be responsible (and shall pay) for making all revisions in other systems in order to allow alternate materials or assemblies to coordinate with originally designed components).

H. BIDDER'S STATEMENT OF CONFORMANCE OF PROPOSED SUBSTITUTION TO CONTRACT REQUIREMENTS
   1. I / we have investigated the proposed substitution. I / we:
   2. Believe that it is equal or superior in all respects to specified product, except as stated above:
   3. Will provide same warranty as specified for specified product:
   4. Have included complete cost data and implications of the substitution;
   5. Will pay redesign and special inspection costs caused by the use of this product:
   6. Will coordinate the incorporation of the proposed substitution into the Work:
   7. Waive future claims for added cost to Contract caused by the substitution.

I. Bidder: _____

J. (Name of prime bidding contractor)

K. Date:_____ By:_____
   1. All questions must be answered and all blanks filled in. Enter "NA" of not applicable. Unresponsive or incomplete requests will be rejected and returned without review.

L. Contractor's submittal of a substitute material or system due to untimely planning and scheduling on his part shall not be permitted.

M. Should the Owner approve the submittal of an alternate material or system (and the Architect does not agree that the material or system is comparable), the Owner shall take full responsibility for the selection.

N. ARCHITECT'S REVIEW AND ACTION
   1. Resubmit substitution request: Yes No
   2. Provide more information in the following areas:_____
      _____
      _____
   3. Prime Bidder must sign Bidder's Statement of Conformance Yes
   4. Substitution is accepted. Yes No
   5. Substitution is accepted, with the following comments:
      _____
      _____

6. Substitution request received too late. Yes No

7. Architect

By:_____Date:_____

The architect has relied upon the information provided by the Contractor, and makes no claim as to the accuracy, completeness, or validity of such information. If an accepted substitution is later found to be not in compliance with the Contract Documents, Contractor shall provide the specified product at no cost to the Owner.

END OF SECTION

SECTION 013100 - PROJECT MANAGEMENT AND COORDINATION

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.

1.2 SUMMARY

A. Section includes administrative provisions for coordinating construction operations on Project including, but not limited to, the following:

1. General coordination procedures.
2. Coordination drawings.
3. Requests for Information (RFIs).
4. Project Web site.
5. Project meetings.

B. Each contractor shall participate in coordination requirements. Certain areas of responsibility are assigned to a specific contractor.

C. Related Requirements:

1. Division 01 Section "Multiple Contract Summary" for a description of the division of work among separate contracts and responsibility for coordination activities not in this Section.
2. Division 01 Section "Construction Progress Documentation" for preparing and submitting Contractor's construction schedule.
3. Division 01 Section "Execution" for procedures for coordinating general installation and field-engineering services, including establishment of benchmarks and control points.
4. Division 01 Section "Closeout Procedures" for coordinating closeout of the Contract.
5. Division 01 Section "General Commissioning Requirements" for coordinating the Work with Owner's Commissioning Authority.

1.3 DEFINITIONS

A. RFI: Request from Owner, Construction Manager, Architect, or Contractor seeking information required by or clarifications of the Contract Documents.

1.4 INFORMATIONAL SUBMITTALS

A. Subcontract List: Prepare a written summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design. Include the following information in tabular form:

1. Name, address, and telephone number of entity performing subcontract or supplying products.
2. Number and title of related Specification Section(s) covered by subcontract.
3. Drawing number and detail references, as appropriate, covered by subcontract.

B. Key Personnel Names: Within 15 days of starting construction operations, submit a list of key personnel assignments, including superintendent and other personnel in attendance at Project site. Identify individuals and their duties and responsibilities; list addresses and telephone numbers, including home, office, and cellular telephone numbers and e-mail addresses. Provide names, addresses, and telephone numbers of individuals assigned as alternates in the absence of individuals assigned to Project.

1. Post copies of list in project meeting room, in temporary field office, on Project Web site, and by each temporary telephone. Keep list current at all times.

1.5 GENERAL COORDINATION PROCEDURES

A. Coordination: Coordinate construction operations included in different Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations, included in different Sections that depend on each other for proper installation, connection, and operation.

1. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
2. Coordinate installation of different components to ensure maximum performance and accessibility for required maintenance, service, and repair.
3. Make adequate provisions to accommodate items scheduled for later installation.

B. Coordination: Each contractor shall coordinate its construction operations with those of other contractors and entities to ensure efficient and orderly installation of each part of the Work. Each contractor shall coordinate its operations with operations, included in different Sections that depend on each other for proper installation, connection, and operation.

1. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
2. Coordinate installation of different components with other contractors to ensure maximum performance and accessibility for required maintenance, service, and repair.
3. Make adequate provisions to accommodate items scheduled for later installation.

C. Prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and list of attendees at meetings.

1. Prepare similar memoranda for Owner and separate contractors if coordination of their Work is required.

D. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities and activities of other contractors to avoid conflicts

and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:

1. Preparation of Contractor's construction schedule.
2. Preparation of the schedule of values.
3. Installation and removal of temporary facilities and controls.
4. Delivery and processing of submittals.
5. Progress meetings.
6. Preinstallation conferences.
7. Project closeout activities.
8. Startup and adjustment of systems.

E. Conservation: Coordinate construction activities to ensure that operations are carried out with consideration given to conservation of energy, water, and materials. Coordinate use of temporary utilities to minimize waste.

1. Salvage materials and equipment involved in performance of, but not actually incorporated into, the Work. See other Sections for disposition of salvaged materials that are designated as Owner's property.

1.6 COORDINATION DRAWINGS

A. Coordination Drawings, General: Prepare coordination drawings according to requirements in individual Sections, and additionally where installation is not completely shown on Shop Drawings, where limited space availability necessitates coordination, or if coordination is required to facilitate integration of products and materials fabricated or installed by more than one entity.

1. Content: Project-specific information, drawn accurately to a scale large enough to indicate and resolve conflicts. Do not base coordination drawings on standard printed data. Include the following information, as applicable:

a. Use applicable Drawings as a basis for preparation of coordination drawings. Prepare sections, elevations, and details as needed to describe relationship of various systems and components.
b. Coordinate the addition of trade-specific information to the coordination drawings by multiple contractors in a sequence that best provides for coordination of the information and resolution of conflicts between installed components before submitting for review.
c. Indicate functional and spatial relationships of components of architectural, structural, civil, mechanical, and electrical systems.
d. Indicate space requirements for routine maintenance and for anticipated replacement of components during the life of the installation.
e. Show location and size of access doors required for access to concealed dampers, valves, and other controls.
f. Indicate required installation sequences.
g. Indicate dimensions shown on the Drawings. Specifically note dimensions that appear to be in conflict with submitted equipment and minimum clearance requirements. Provide alternate sketches to Architect indicating proposed

resolution of such conflicts. Minor dimension changes and difficult installations will not be considered changes to the Contract.

B. Coordination Drawing Organization: Organize coordination drawings as follows:

1. Floor Plans and Reflected Ceiling Plans: Show architectural and structural elements, and mechanical, plumbing, fire-protection, fire-alarm, and electrical Work. Show locations of visible ceiling-mounted devices relative to acoustical ceiling grid. Supplement plan drawings with section drawings where required to adequately represent the Work.
2. Plenum Space: Indicate subframing for support of ceiling and wall systems, mechanical and electrical equipment, and related Work. Locate components within ceiling plenum to accommodate layout of light fixtures indicated on Drawings. Indicate areas of conflict between light fixtures and other components.
3. Mechanical Rooms: Provide coordination drawings for mechanical rooms showing plans and elevations of mechanical, plumbing, fire-protection, fire-alarm, and electrical equipment.
4. Structural Penetrations: Indicate penetrations and openings required for all disciplines.
5. Slab Edge and Embedded Items: Indicate slab edge locations and sizes and locations of embedded items for metal fabrications, sleeves, anchor bolts, bearing plates, angles, door floor closers, slab depressions for floor finishes, curbs and housekeeping pads, and similar items.
6. Mechanical and Plumbing Work: Show the following:

    a. Sizes and bottom elevations of ductwork, piping, and conduit runs, including insulation, bracing, flanges, and support systems.
    b. Dimensions of major components, such as dampers, valves, diffusers, access doors, cleanouts and electrical distribution equipment.
    c. Fire-rated enclosures around ductwork.

7. Electrical Work: Show the following:

    a. Runs of vertical and horizontal conduit 1-1/4 inches (32 mm) in diameter and larger.
    b. Light fixture, exit light, emergency battery pack, smoke detector, and other fire-alarm locations.
    c. Panel board, switch board, switchgear, transformer, busway, generator, and motor control center locations.
    d. Location of pull boxes and junction boxes, dimensioned from column center lines.

8. Fire-Protection System: Show the following:

    a. Locations of standpipes, mains piping, branch lines, pipe drops, and sprinkler heads.

9. Review: Architect will review coordination drawings to confirm that the Work is being coordinated, but not for the details of the coordination, which are Contractor's responsibility. If Architect determines that coordination drawings are not being prepared in sufficient scope or detail, or are otherwise deficient, Architect will so inform Contractor, who shall make changes as directed and resubmit.
10. Coordination Drawing Prints: Prepare coordination drawing prints according to requirements in Division 01 Section "Submittal Procedures."

C. Coordination Digital Data Files: Prepare coordination digital data files according to the following requirements:

1. File Preparation Format: Same digital data software program, version, and operating system as original Drawings.
2. File Preparation Format: DWG, Autodesk Revit 2013 or 2015, operating in Microsoft Windows operating system.
3. File Submittal Format: Submit or post coordination drawing files using format same as file preparation format and Portable Data File (PDF) format.

4. Architect will furnish Contractor one set of digital data files of Drawings for use in preparing coordination digital data files.

   a. Architect makes no representations as to the accuracy or completeness of digital data files as they relate to Drawings.
   b. Digital Data Software Program: Drawings are available in Autodesk Revit 2013 or 2015, operating in Microsoft Windows operating system.
   c. Contractor shall execute a data licensing agreement in the form of Agreement included in this Project Manual.

1.7 REQUESTS FOR INFORMATION (RFIs)

A. General: Immediately on discovery of the need for additional information or interpretation of the Contract Documents, Contractor shall prepare and submit an RFI in the form specified.

1. Architect will return RFIs submitted to Architect by other entities controlled by Contractor with no response.
2. Coordinate and submit RFIs in a prompt manner so as to avoid delays in Contractor's work or work of subcontractors.

B. Content of the RFI: Include a detailed, legible description of item needing information or interpretation and the following:

1. Project name.
2. Project number.
3. Date.
4. Name of Contractor.
5. Name of Architect and Construction Manager.
6. RFI number, numbered sequentially.
7. RFI subject.
8. Specification Section number and title and related paragraphs, as appropriate.
9. Drawing number and detail references, as appropriate.
10. Field dimensions and conditions, as appropriate.
11. Contractor's suggested resolution. If Contractor's suggested resolution impacts the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.
12. Contractor's signature.

13. Attachments: Include sketches, descriptions, measurements, photos, Product Data, Shop Drawings, coordination drawings, and other information necessary to fully describe items needing interpretation.

    a. Include dimensions, thicknesses, structural grid references, and details of affected materials, assemblies, and attachments on attached sketches.

C. RFI Forms: AIA Document G716.

1. Attachments shall be electronic files in Adobe Acrobat PDF format.

D. Architect's and Construction Manager's Action: Architect and Construction Manager will review each RFI, determine action required, and respond. Allow seven working days for Architect's response for each RFI. RFIs received by Architect or Construction Manager after 1:00 p.m. will be considered as received the following working day.

1. The following Contractor-generated RFIs will be returned without action. RFIs may only be used to request additional information. They are not intended as a means of circumventing the specified submittal or substitution process, nor are they to be used to make changes in the contract:

    a. Requests for approval of submittals.
    b. Requests for approval of substitutions.
    c. Requests for approval of Contractor's means and methods.
    d. Requests for coordination information already indicated in the Contract Documents.
    e. Requests for adjustments in the Contract Time or the Contract Sum.
    f. Requests for interpretation of Architect's actions on submittals.
    g. Incomplete RFIs or inaccurately prepared RFIs.

2. Architect's action may include a request for additional information, in which case Architect's time for response will date from time of receipt of additional information.
3. Architect's action on RFIs that may result in a change to the Contract Time or the Contract Sum may be eligible for Contractor to submit Change Proposal according to Division 01 Section "Contract Modification Procedures."

    a. If Contractor believes the RFI response warrants change in the Contract Time or the Contract Sum, notify Architect and Construction Manager in writing within 10 days of receipt of the RFI response.

E. RFI Log: Prepare, maintain, and submit a tabular log of RFIs organized by the RFI number. Submit log weekly. Include the following:

1. Project name.
2. Name and address of Contractor.
3. Name and address of Architect and Construction Manager.
4. RFI number including RFIs that were returned without action or withdrawn.
5. RFI description.
6. Date the RFI was submitted.
7. Date Architect's and Construction Manager's response was received.

F. On receipt of Architect's and Construction Manager's action, update the RFI log and immediately distribute the RFI response to affected parties. Review response and notify Architect and Construction Manager within seven days if Contractor disagrees with response.

1. Identification of related Minor Change in the Work, Construction Change Directive, and Proposal Request, as appropriate.
2. Identification of related Field Order, Work Change Directive, and Proposal Request, as appropriate.
3. No work to be initiated if answer involves additional cost to Owner without specific written approval of Owner.

1.8 PROJECT WEB SITE

A. Use Architect's Project Web (FTP) site for purposes of hosting and managing project communication and documentation until Final Completion. Project Web site shall include the following functions:

1. Project directory.
2. Project correspondence.
3. Meeting minutes.
4. Contract modifications forms and logs.
5. RFI forms and logs.
6. Task and issue management.
7. Photo documentation.
8. Schedule and calendar management.
9. Submittals forms and logs.
10. Payment application forms.
11. Drawing and specification document hosting, viewing, and updating.
12. Online document collaboration.
13. Reminder and tracking functions.
14. Archiving functions.

B. The Owner, Owner's Commissioning Authority, Construction Manager, Contractor and Architect's consultants may use the Architect's FTP site at no cost.

C. On completion of Project, provide one complete archive copy(ies) of Project Web site files to Owner and to Architect in a digital storage format acceptable to Architect.

D. The Architect will provide the following Electronic Project Management system which will be used for purposes of managing communication and documents during the construction stage: Newforma.

D. Contractor, subcontractors, and other parties granted access by Contractor to Project Web site shall execute a data licensing agreement in the form of AIA Document C106.

1.9 PROJECT MEETINGS

A. General: Schedule and conduct meetings and conferences at Project site unless otherwise indicated.

1. Attendees: Inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Notify Owner and Architect of scheduled meeting dates and times.
2. Agenda: Prepare the meeting agenda. Distribute the agenda to all invited attendees.
3. Minutes: Entity responsible for conducting meeting will record significant discussions and agreements achieved. Distribute the meeting minutes to everyone concerned, including Owner, Construction Manager, and Architect, within three days of the meeting.

B. Preconstruction Conference: Schedule and conduct a preconstruction conference before starting construction, at a time convenient to Owner and Architect, but no later than 15 days after execution of the Agreement.

1. Conduct the conference to review responsibilities and personnel assignments.
2. Attendees: Authorized representatives of Owner, Owner's Commissioning Authority, Construction Manager, Architect, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the conference. Participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
3. Agenda: Discuss items of significance that could affect progress, including the following:

    a. Tentative construction schedule.
    b. Phasing.
    c. Critical work sequencing and long-lead items.
    d. Designation of key personnel and their duties.
    e. Lines of communications.
    f. Procedures for processing field decisions and Change Orders.
    g. Procedures for RFIs.
    h. Procedures for testing and inspecting.
    i. Procedures for processing Applications for Payment.
    j. Distribution of the Contract Documents.
    k. Submittal procedures.
    l. Preparation of record documents.
    m. Use of the premises.
    n. Work restrictions.
    o. Working hours.
    p. Owner's occupancy requirements.
    q. Responsibility for temporary facilities and controls.
    r. Procedures for moisture and mold control.
    s. Procedures for disruptions and shutdowns.
    t. Construction waste management and recycling if required by authorities having jurisdiction.
    u. Parking availability.
    v. Office, work, and storage areas.
    w. Equipment deliveries and priorities.
    x. First aid.
    y. Security.
    z. Progress cleaning.

4. Minutes: Entity responsible for conducting meeting will record and distribute meeting minutes.

C. Preinstallation Conferences: Conduct a preinstallation conference at Project site before each construction activity that requires coordination with other construction.

1. Attendees: Installer and representatives of manufacturers and fabricators involved in or affected by the installation and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Advise Architect, Construction Manager, and Owner's Commissioning Authority of scheduled meeting dates.
2. Agenda: Review progress of other construction activities and preparations for the particular activity under consideration, including requirements for the following:

   a. Contract Documents.
   b. Options.
   c. Related RFIs.
   d. Related Change Orders.
   e. Purchases.
   f. Deliveries.
   g. Submittals.
   h. Review of mockups.
   i. Possible conflicts.
   j. Compatibility requirements.
   k. Time schedules.
   l. Weather limitations.
   m. Manufacturer's written instructions.
   n. Warranty requirements.
   o. Compatibility of materials.
   p. Acceptability of substrates.
   q. Temporary facilities and controls.
   r. Space and access limitations.
   s. Regulations of authorities having jurisdiction.
   t. Testing and inspecting requirements.
   u. Installation procedures.
   v. Coordination with other work.
   w. Required performance results.
   x. Protection of adjacent work.
   y. Protection of construction and personnel.

3. Record significant conference discussions, agreements, and disagreements, including required corrective measures and actions.
4. Reporting: Distribute minutes of the meeting to each party present and to other parties requiring information.
5. Do not proceed with installation if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of the Work and reconvene the conference at earliest feasible date.

D. Project Closeout Conference: Schedule and conduct a project closeout conference, at a time convenient to Owner and Architect, but no later than 90 days prior to the scheduled date of Substantial Completion.

1. Conduct the conference to review requirements and responsibilities related to Project closeout.
2. Attendees: Authorized representatives of Owner, Owner's Commissioning Authority, Construction Manager, Architect, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the meeting. Participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
3. Agenda: Discuss items of significance that could affect or delay Project closeout, including the following:

    a. Preparation of record documents.
    b. Procedures required prior to inspection for Substantial Completion and for final inspection for acceptance.
    c. Submittal of written warranties.
    d. Requirements for preparing operations and maintenance data.
    e. Requirements for delivery of material samples, attic stock, and spare parts.
    f. Requirements for demonstration and training.
    g. Preparation of Contractor's punch list.
    h. Procedures for processing Applications for Payment at Substantial Completion and for final payment.
    i. Submittal procedures.
    j. Coordination of separate contracts.
    k. Owner's partial occupancy requirements.
    l. Installation of Owner's furniture, fixtures, and equipment.
    m. Responsibility for removing temporary facilities and controls.

4. Minutes: Entity conducting meeting will record and distribute meeting minutes.

E. Progress Meetings: Conduct progress meetings at biweekly intervals.

1. Coordinate dates of meetings with preparation of payment requests.
2. Attendees: In addition to representatives of Owner, Owner's Commissioning Authority, Construction Manager, and Architect, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
3. Agenda: Review and correct or approve minutes of previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.

    a. Contractor's Construction Schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Contractor's construction schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.

        1) Review schedule for next period.

b. Review present and future needs of each entity present, including the following:

1) Interface requirements.
2) Sequence of operations.
3) Resolution of BIM component conflicts.
4) Status of submittals.
5) Deliveries.
6) Off-site fabrication.
7) Access.
8) Site utilization.
9) Temporary facilities and controls.
10) Progress cleaning.
11) Quality and work standards.
12) Status of correction of deficient items.
13) Field observations.
14) Status of RFIs.
15) Status of proposal requests.
16) Pending changes.
17) Status of Change Orders.
18) Pending claims and disputes.
19) Documentation of information for payment requests.

4. Minutes: Entity responsible for conducting the meeting will record and distribute the meeting minutes to each party present and to parties requiring information.

a. Schedule Updating: Revise Contractor's construction schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with the report of each meeting.

F. Coordination Meetings: Conduct Project coordination meetings at weekly intervals. Project coordination meetings are in addition to specific meetings held for other purposes, such as progress meetings and preinstallation conferences.

1. Attendees: In addition to representatives of Owner, Owner's Commissioning Authority, Construction Manager, and Architect, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the meetings shall be familiar with Project and authorized to conclude matters relating to the Work.
2. Agenda: Review and correct or approve minutes of the previous coordination meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.

a. Combined Contractor's Construction Schedule: Review progress since the last coordination meeting. Determine whether each contract is on time, ahead of schedule, or behind schedule, in relation to combined Contractor's construction schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.

b. Schedule Updating: Revise combined Contractor's construction schedule after each coordination meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with report of each meeting.

c. Review present and future needs of each contractor present, including the following:

1) Interface requirements.
2) Sequence of operations.
3) Resolution of BIM component conflicts.
4) Status of submittals.
5) Deliveries.
6) Off-site fabrication.
7) Access.
8) Site utilization.
9) Temporary facilities and controls.
10) Work hours.
11) Hazards and risks.
12) Progress cleaning.
13) Quality and work standards.
14) Change Orders.

3. Reporting: Record meeting results and distribute copies to everyone in attendance and to others affected by decisions or actions resulting from each meeting.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 013100

SECTION 013233 - PHOTOGRAPHIC DOCUMENTATION

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.

1.2 SUMMARY

A. Section includes administrative and procedural requirements for the following:

1. Preconstruction photographs.
2. Periodic construction photographs.
3. Final completion construction photographs.

B. Owner may provide a web cam mounted on an adjacent building to allow 24 -7 viewing of the project.

C. Related Requirements:
1. Division 01 Section "Submittal Procedures" for submitting photographic documentation.
2. Division 01 Section "Closeout Procedures" for submitting photographic documentation as project record documents at Project closeout.
3. Division 01 Section "Demonstration and Training" for submitting video recordings of demonstration of equipment and training of Owner's personnel.
4. Division 02 Section "Selective Structure Demolition" for photographic documentation before selective demolition operations commence.
5. Division 31 Section "Site Clearing" for photographic documentation before site clearing operations commence.

1.3 UNIT PRICES

A. Basis for Bids: Base number of construction photographs on average of 20 photographs per week over the duration of Project.

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For photographic documentation service provider.

B. Digital Photographs: Submit image files within three days of taking photographs.

1. Digital Camera: Minimum sensor resolution of 8 megapixels.

2. Format: Minimum 3200 by 2400 pixels, in unaltered original files, with same aspect ratio as the sensor, uncropped, date and time stamped, in folder named by date of photograph, accompanied by key plan file.
3. Identification: Provide the following information with each image description in file metadata tag:

    a. Name of Project.
    b. Name and contact information for photographer.
    c. Name of Architect and Construction Manager.
    d. Name of Contractor.
    e. Date photograph was taken.
    f. Description of vantage point, indicating location, direction (by compass point), and elevation or story of construction.
    g. Weather conditions at time of recording.
    h. Unique sequential identifier keyed to accompanying key plan.

4. General Contractor (GC) to email a report with 10-30 photographs of construction site and work in progress each week to owner, architect and all consultants. GC to upload report to ZCA FTP site. Each photo to indicate from where it was taken and a description of work in progress. Number of photos can vary between 10 and 30 based on stage of construction. Key plan is not required, simple verbal description of vantage point is sufficient (e.g.: view of main entry looking west, view of drive-through looking east, etc.)

1.5 QUALITY ASSURANCE

A. Photographer Qualifications: An individual who has been regularly engaged as a professional photographer of construction projects for not less than three years.

B. Web-Based Photographic Documentation Service Provider: A firm specializing in providing photographic equipment, Web-based software, and related services for construction projects, with record of providing satisfactory services similar to those required for Project.

1.6 USAGE RIGHTS

A. Obtain and transfer copyright usage rights from photographer to Owner for unlimited reproduction of photographic documentation.

PART 2 - PRODUCTS

2.1 PHOTOGRAPHIC MEDIA

A. Digital Images: Provide images in JPG format, produced by a digital camera with minimum sensor size of 8 megapixels, and at an image resolution of not less than 3200 by 2400 pixels.

3.1 CONSTRUCTION PHOTOGRAPHS

A. Photographer: Engage a qualified photographer to take construction photographs.

B. General: Take photographs using the maximum range of depth of field, and that are in focus, to clearly show the Work. Photographs with blurry or out-of-focus areas will not be accepted.

1. Maintain key plan with each set of construction photographs that identifies each photographic location.

C. Digital Images: Submit digital images exactly as originally recorded in the digital camera, without alteration, manipulation, editing, or modifications using image-editing software.

1. Date and Time: Include date and time in file name for each image.
2. Field Office Images: Maintain one set of images accessible in the field office at Project site, available at all times for reference. Identify images in the same manner as those submitted to Architect and Construction Manager.

D. Preconstruction Photographs: Before commencement of demolition, take photographs of Project site and surrounding properties, including existing items to remain during construction, from different vantage points, as directed by Architect and.

1. Flag excavation areas and construction limits before taking construction photographs.
2. Take 20 photographs to show existing conditions adjacent to property before starting the Work.
3. Take 20 photographs of existing buildings either on or adjoining property to accurately record physical conditions at start of construction.
4. Take additional photographs as required to record settlement or cracking of adjacent structures, pavements, and improvements.

E. Periodic Construction Photographs: Take 10 to 30 photographs weekly, with timing each month adjusted to coincide with the cutoff date associated with each Application for Payment. Select vantage points to show status of construction and progress since last photographs were taken.

F. Architect and / or Construction Manager-Directed Construction Photographs: From time to time, Architect and / or Construction Manager will instruct photographer about number and frequency of photographs and general directions on vantage points. Select actual vantage points and take photographs to show the status of construction and progress since last photographs were taken.

G. Final Completion Construction Photographs: Take 30 color photographs after date of Substantial Completion for submission as project record documents. Architect will inform photographer of desired vantage points.

1. Do not include date stamp.

H. Additional Photographs: Architect may request photographs in addition to periodic photographs specified. Additional photographs will be paid for by Change Order and are not included in the Contract Sum or in the allowance for construction photographs.

1. Three days' notice will be given, where feasible.
2. In emergency situations, take additional photographs within 24 hours of request.
3. Circumstances that could require additional photographs include, but are not limited to, the following:

    a. Special events planned at Project site.
    b. Immediate follow-up when on-site events result in construction damage or losses.
    c. Photographs to be taken at fabrication locations away from Project site. These photographs are not subject to unit prices or unit-cost allowances.
    d. Substantial Completion of a major phase or component of the Work.
    e. Extra record photographs at time of final acceptance.
    f. Owner's request for special publicity photographs.

END OF SECTION 013233

SECTION 013300 - SUBMITTAL PROCEDURES

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.

1.2 SUMMARY

A. Section includes requirements for the submittal schedule and administrative and procedural requirements for submitting Shop Drawings, Product Data, Samples, and other submittals.

B. Related Requirements:

1. Division 01 Section "Payment Procedures" for submitting Applications for Payment and the schedule of values.
2. Division 01 Section "Construction Progress Documentation" for submitting schedules and reports, including Contractor's construction schedule.
3. Division 01 Section "Operation and Maintenance Data" for submitting operation and maintenance manuals.
4. Division 01 Section "Project Record Documents" for submitting record Drawings, record Specifications, and record Product Data.
5. Division 01 Section "Demonstration and Training" for submitting video recordings of demonstration of equipment and training of Owner's personnel.

1.3 DEFINITIONS

A. Action Submittals: Written and graphic information and physical samples that require Architect's and Construction Manager's responsive action. Action submittals are those submittals indicated in individual Specification Sections as "action submittals."

B. Informational Submittals: Written and graphic information and physical samples that do not require Architect's and Construction Manager's responsive action. Submittals may be rejected for not complying with requirements. Informational submittals are those submittals indicated in individual Specification Sections as "informational submittals."

C. File Transfer Protocol (FTP): Communications protocol that enables transfer of files to and from another computer over a network and that serves as the basis for standard Internet protocols. An FTP site is a portion of a network located outside of network firewalls within which internal and external users are able to access files.

D. Portable Document Format (PDF): An open standard file format licensed by Adobe Systems used for representing documents in a device-independent and display resolution-independent fixed-layout document format.

1.4 ACTION SUBMITTALS

A. LEED Related Action Plan:
   1. Construction Waste Management Plan
   2. Indoor Air Quality Plan During Construction
   3. Monthly LEED Construction Credit Documentation Status Reports

B. Submittal Schedule: Submit a schedule of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, ordering, manufacturing, fabrication, and delivery when establishing dates. Include additional time required for making corrections or revisions to submittals noted by Architect and additional time for handling and reviewing submittals required by those corrections.

   1. Coordinate submittal schedule with list of subcontracts, the schedule of values, and Contractor's construction schedule.
   2. Initial Submittal: Submit concurrently with startup construction schedule. Include submittals required during the first 60 days of construction. List those submittals required to maintain orderly progress of the Work and those required early because of long lead time for manufacture or fabrication.
   3. Final Submittal: Submit concurrently with the first complete submittal of Contractor's construction schedule.

      a. Submit revised submittal schedule to reflect changes in current status and timing for submittals.

   4. Format: Arrange the following information in a tabular format:

      a. Scheduled date for first submittal.
      b. Specification Section number and title.
      c. Submittal category: Action; informational.
      d. Name of subcontractor.
      e. Description of the Work covered.
      f. Scheduled date for Architect's final release or approval.
      g. Scheduled date of fabrication.
      h. Scheduled dates for purchasing.
      i. Scheduled dates for installation.
      j. Activity or event number.

1.5 SUBMITTAL ADMINISTRATIVE REQUIREMENTS

A. Architect's Digital Data Files: Electronic digital data files of the Contract Drawings may be provided by Architect for Contractor's use in preparing submittals.

   1. Architect will furnish Contractor one set of digital data drawing files of the Contract Drawings for use in preparing Shop Drawings and Project record drawings.

a. Architect makes no representations as to the accuracy or completeness of digital data drawing files as they relate to the Contract Drawings.
b. Digital Drawing Software Program: The Contract Drawings are available in Autodesk Architectural Desktop 2006, operating in Microsoft Windows operating system.
c. Contractor shall execute a data licensing agreement in the form of Agreement included in Project Manual.
d. The following digital data files will by furnished for each appropriate discipline:

1) Floor plans.
2) Reflected ceiling plans.
3) Sections as necessary.

B. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.

1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
2. Submit all submittal items required for each Specification Section concurrently unless partial submittals for portions of the Work are indicated on approved submittal schedule.
3. Submit action submittals and informational submittals required by the same Specification Section as separate packages under separate transmittals.
4. Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination.

a. Architect reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.

C. Processing Time: Allow time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Architect's receipt of submittal. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.

1. Initial Review: Allow 15 days for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. Architect will advise Contractor when a submittal being processed must be delayed for coordination.
2. Intermediate Review: If intermediate submittal is necessary, process it in same manner as initial submittal.
3. Resubmittal Review: Allow 15 days for review of each resubmittal.
4. Sequential Review: Where sequential review of submittals by Architect's consultants, Owner, or other parties is indicated, allow 21 days for initial review of each submittal.
5. Concurrent Consultant Review: Where the Contract Documents indicate that submittals may be transmitted simultaneously to Architect and to Architect's consultants, allow 15 days for review of each submittal. Submittal will be returned to Architect before being returned to Contractor.

D. Paper Submittals – Whenever possible, submit product data and shop drawings digitally. See Item E. below. However, when it is not possible to submit digitally, submit hard paper copies per the following requirements. (Reference Item 2.2 Delegated Design Services): Place a permanent label or title block on each submittal item for identification.

1. Indicate name of firm or entity that prepared each submittal on label or title block.
2. Provide a space approximately 6 by 8 inches (150 by 200 mm) on label or beside title block to record Contractor's review and approval markings and action taken by Architect.
3. Include the following information for processing and recording action taken:

    a. Project name.
    b. Date.
    c. Name of Architect.
    d. Name of Construction Manager.
    e. Name of Contractor.
    f. Name of subcontractor.
    g. Name of supplier.
    h. Name of manufacturer.
    i. Submittal number or other unique identifier, including revision identifier.

        1) Submittal number shall use Specification Section number followed by a decimal point and then a sequential number (e.g., 061000.01). Resubmittals shall include an alphabetic suffix after another decimal point (e.g., 061000.01.A).

    j. Number and title of appropriate Specification Section.
    k. Drawing number and detail references, as appropriate.
    l. Location(s) where product is to be installed, as appropriate.
    m. Other necessary identification.

4. Additional Paper Copies: Unless additional copies are required for final submittal, and unless Architect observes noncompliance with provisions in the Contract Documents, initial submittal may serve as final submittal.

    a. Submit one copy of submittal to concurrent reviewer in addition to specified number of copies to Architect.

5. Transmittal for Paper Submittals: Assemble each submittal individually and appropriately for transmittal and handling. Transmit each submittal using a transmittal form. Architect will discard submittals received from sources other than Contractor.

    a. Transmittal Form for Paper Submittals: AIA Document G810.
    b. Transmittal Form for Paper Submittals: Provide locations on form for the following information:

        1) Project name.
        2) Date.
        3) Destination (To:).
        4) Source (From:).

5) Name and address of Architect.
6) Name of Construction Manager.
7) Name of Contractor.
8) Name of firm or entity that prepared submittal.
9) Names of subcontractor, manufacturer, and supplier.
10) Category and type of submittal.
11) Submittal purpose and description.
12) Specification Section number and title.
13) Specification paragraph number or drawing designation and generic name for each of multiple items.
14) Drawing number and detail references, as appropriate.
15) Indication of full or partial submittal.
16) Transmittal number, numbered consecutively.
17) Submittal and transmittal distribution record.
18) Remarks.
19) Signature of transmitter.

E. Electronic Submittals: Identify and incorporate information in each electronic submittal file as follows:

1. Assemble complete submittal package into a single indexed file incorporating submittal requirements of a single Specification Section and transmittal form with links enabling navigation to each item.
2. Name file with submittal number or other unique identifier, including revision identifier.

   a. File name shall use project identifier and Specification Section number followed by a decimal point and then a sequential number (e.g., LNHS-061000.01). Resubmittals shall include an alphabetic suffix after another decimal point (e.g., LNHS-061000.01.A).

3. Provide means for insertion to permanently record Contractor's review and approval markings and action taken by Architect.
4. Transmittal Form for Electronic Submittals: Use electronic form acceptable to Owner, containing the following information:

   a. Project name.
   b. Date.
   c. Name and address of Architect.
   d. Name of Construction Manager.
   e. Name of Contractor.
   f. Name of firm or entity that prepared submittal.
   g. Names of subcontractor, manufacturer, and supplier.
   h. Category and type of submittal.
   i. Submittal purpose and description.
   j. Specification Section number and title.
   k. Specification paragraph number or drawing designation and generic name for each of multiple items.
   l. Drawing number and detail references, as appropriate.
   m. Location(s) where product is to be installed, as appropriate.
   n. Related physical samples submitted directly.
   o. Indication of full or partial submittal.

p. Transmittal number, numbered consecutively.
q. Submittal and transmittal distribution record.
r. Other necessary identification.
s. Remarks.

5. Metadata: Include the following information as keywords in the electronic submittal file metadata:

a. Project name.
b. Number and title of appropriate Specification Section.
c. Manufacturer name.
d. Product name.

F. Options: Identify options requiring selection by Architect.

G. Deviations and Additional Information: On an attached separate sheet, prepared on Contractor's letterhead, record relevant information, requests for data, revisions other than those requested by Architect on previous submittals, and deviations from requirements in the Contract Documents, including minor variations and limitations. Include same identification information as related submittal.

H. Resubmittals: Make resubmittals in same form and number of copies as initial submittal.

1. Note date and content of previous submittal.
2. Note date and content of revision in label or title block and clearly indicate extent of revision.
3. Resubmit submittals until they are marked with approval notation from Architect's action stamp.

I. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.

J. Use for Construction: Retain complete copies of submittals on Project site. Use only final action submittals that are marked with approval notation from Architect's action stamp.

PART 2 - PRODUCTS

2.1 SUBMITTAL PROCEDURES

A. General Submittal Procedure Requirements: Prepare and submit submittals required by individual Specification Sections. Types of submittals are indicated in individual Specification Sections.

1. Post electronic submittals as PDF electronic files directly to Architect's FTP site specifically established for Project.

a. Architect will return annotated file. Annotate and retain one copy of file as an electronic Project record document file.

2. Certificates and Certifications Submittals: Provide a statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity.

   a. Provide a digital signature with digital certificate on electronically submitted certificates and certifications where indicated.
   b. Provide a notarized statement on original paper copy certificates and certifications where indicated.

B. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.

1. If information must be specially prepared for submittal because standard published data are not suitable for use, submit as Shop Drawings, not as Product Data.
2. Mark each copy of each submittal to show which products and options are applicable.
3. Include the following information, as applicable:

   a. Manufacturer's catalog cuts.
   b. Manufacturer's product specifications.
   c. Standard color charts.
   d. Statement of compliance with specified referenced standards.
   e. Testing by recognized testing agency.
   f. Application of testing agency labels and seals.
   g. Notation of coordination requirements.
   h. Availability and delivery time information.

4. For equipment, include the following in addition to the above, as applicable:

   a. Wiring diagrams showing factory-installed wiring.
   b. Printed performance curves.
   c. Operational range diagrams.
   d. Clearances required to other construction, if not indicated on accompanying Shop Drawings.

5. Submit Product Data before or concurrent with Samples.
6. Submit Product Data in the following format:
   a. PDF electronic file.

C. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data, unless submittal based on Architect's digital data drawing files is otherwise permitted.

1. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:

   a. Identification of products.
   b. Schedules.

c. Compliance with specified standards.
d. Notation of coordination requirements.
e. Notation of dimensions established by field measurement.
f. Relationship and attachment to adjoining construction clearly indicated.
g. Seal and signature of professional engineer if specified.

2. Sheet Size: Except for templates, patterns, and similar full-size drawings, submit Shop Drawings on sheets at least [8-1/2 by 11 inches (215 by 280 mm), but no larger than 30 by 42 inches (750 by 1067 mm).
3. Submit Shop Drawings in the following format:
   a. PDF electronic file.

D. Samples: Submit Samples for review of kind, color, pattern, and texture for a check of these characteristics with other elements and for a comparison of these characteristics between submittal and actual component as delivered and installed.

1. Transmit Samples that contain multiple, related components such as accessories together in one submittal package.
2. Identification: Attach label on unexposed side of Samples that includes the following:

   a. Generic description of Sample.
   b. Product name and name of manufacturer.
   c. Sample source.
   d. Number and title of applicable Specification Section.
   e. Specification paragraph number and generic name of each item.

3. For projects where electronic submittals are required, provide corresponding electronic submittal of Sample transmittal, digital image file illustrating Sample characteristics, and identification information for record.
4. Disposition: Maintain sets of approved Samples at Project site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.

   a. Samples that may be incorporated into the Work are indicated in individual Specification Sections. Such Samples must be in an undamaged condition at time of use.
   b. Samples not incorporated into the Work, or otherwise designated as Owner's property, are the property of Contractor.

5. Samples for Initial Selection: Submit manufacturer's color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available.

   a. Number of Samples: Submit three full set(s) of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line. Architect will return submittal with options selected.

6. Samples for Verification: Submit full-size units or Samples of size indicated, prepared from same material to be used for the Work, cured and finished in manner specified, and physically identical with material or product proposed for use, and that show full range of color and texture variations expected. Samples include, but are not limited to, the following: partial sections of manufactured or fabricated components; small cuts or containers of materials; complete units of repetitively used materials; swatches showing color, texture, and pattern; color range sets; and components used for independent testing and inspection.

    a. Number of Samples: Submit three sets of Samples. Architect will retain one Sample set; remainder will be returned.

        1) Submit a single Sample where assembly details, workmanship, fabrication techniques, connections, operation, and other similar characteristics are to be demonstrated.
        2) If variation in color, pattern, texture, or other characteristic is inherent in material or product represented by a Sample, submit at least three sets of paired units that show approximate limits of variations.

E. Product Schedule: As required in individual Specification Sections, prepare a written summary indicating types of products required for the Work and their intended location. Include the following information in tabular form:

1. Type of product. Include unique identifier for each product indicated in the Contract Documents or assigned by Contractor if none is indicated.
2. Manufacturer and product name, and model number if applicable.
3. Number and name of room or space.
4. Location within room or space.
5. Submit product schedule in the following format:
    a. PDF electronic file.

F. Coordination Drawing Submittals: Comply with requirements specified in Division 01 Section "Project Management and Coordination."

G. Contractor's Construction Schedule: Comply with requirements specified in Division 01 Section "Construction Progress Documentation."

H. Application for Payment and Schedule of Values: Comply with requirements specified in Division 01 Section "Payment Procedures."

I. Test and Inspection Reports and Schedule of Tests and Inspections Submittals: Comply with requirements specified in Division 01 Section "Quality Requirements."

J. Closeout Submittals and Maintenance Material Submittals: Comply with requirements specified in Division 01 Section "Closeout Procedures."

K. Maintenance Data: Comply with requirements specified in Division 01 Section "Operation and Maintenance Data."

L. LEED Submittals: Comply with requirements specified in Division 01 sustainable design requirements Section.

M. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, contact information of architects and owners, and other information specified.

N. Welding Certificates: Prepare written certification that welding procedures and personnel comply with requirements in the Contract Documents. Submit record of Welding Procedure Specification and Procedure Qualification Record on AWS forms. Include names of firms and personnel certified.

O. Installer Certificates: Submit written statements on manufacturer's letterhead certifying that Installer complies with requirements in the Contract Documents and, where required, is authorized by manufacturer for this specific Project.

P. Manufacturer Certificates: Submit written statements on manufacturer's letterhead certifying that manufacturer complies with requirements in the Contract Documents. Include evidence of manufacturing experience where required.

Q. Product Certificates: Submit written statements on manufacturer's letterhead certifying that product complies with requirements in the Contract Documents.

R. Material Certificates: Submit written statements on manufacturer's letterhead certifying that material complies with requirements in the Contract Documents.

S. Material Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements in the Contract Documents.

T. Product Test Reports: Submit written reports indicating that current product produced by manufacturer complies with requirements in the Contract Documents. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.

U. Research Reports: Submit written evidence, from a model code organization acceptable to authorities having jurisdiction, that product complies with building code in effect for Project. Include the following information:

1. Name of evaluation organization.
2. Date of evaluation.
3. Time period when report is in effect.
4. Product and manufacturers' names.
5. Description of product.
6. Test procedures and results.
7. Limitations of use.

V. Preconstruction Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of tests performed before installation of product, for compliance with performance requirements in the Contract Documents.

W. Compatibility Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of compatibility tests performed before installation of product. Include written recommendations for primers and substrate preparation needed for adhesion.

X. Field Test Reports: Submit written reports indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements in the Contract Documents.

Y. Design Data: Prepare and submit written and graphic information, including, but not limited to, performance and design criteria, list of applicable codes and regulations, and calculations. Include list of assumptions and other performance and design criteria and a summary of loads. Include load diagrams if applicable. Provide name and version of software, if any, used for calculations. Include page numbers.

2.2 DELEGATED-DESIGN SERVICES

A. Performance and Design Criteria: Where professional design services or certifications by a design professional are specifically required of Contractor by the Contract Documents, provide products and systems complying with specific performance and design criteria indicated.

1. If criteria indicated are not sufficient to perform services or certification required, submit a written request for additional information to Architect.

B. Delegated-Design Services Certification: In addition to Shop Drawings, Product Data, and other required submittals, submit digitally signed PDF electronic file and three paper copies of certificate, signed and sealed by the responsible design professional, for each product and system specifically assigned to Contractor to be designed or certified by a design professional.

1. Indicate that products and systems comply with performance and design criteria in the Contract Documents. Include list of codes, loads, and other factors used in performing these services.

PART 3 - EXECUTION

3.1 CONTRACTOR'S REVIEW

A. Action and Informational Submittals: Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Architect.

B. Project Closeout and Maintenance Material Submittals: See requirements in Division 01 Section "Closeout Procedures."

C. Approval Stamp: Stamp each submittal with a uniform, approval stamp. Include Project name and location, submittal number, Specification Section title and number, name of reviewer, date of Contractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.

3.2 ARCHITECT'S ACTION

A. Action Submittals: Architect will review each submittal, make marks to indicate corrections or revisions required, and return it. Architect will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action.

B. Informational Submittals: Architect will review each submittal and will return it if it does not comply with requirements. Architect will forward each submittal to appropriate party.

C. Partial submittals prepared for a portion of the Work will be reviewed when use of partial submittals has received prior approval from Architect.

D. Incomplete submittals are unacceptable, will be considered nonresponsive, and will be returned for resubmittal without review.

E. Submittals not required by the Contract Documents may be returned by the Architect without action.

END OF SECTION 013300

ELECTRONIC DATA TRANSFER UMBRELLA AGREEMENT

This Electronic Data Transfer Umbrella Agreement ("Umbrella Agreement") is entered into between _____ ("Recipient") and Ziegler Cooper, Inc. and/or ZCA Residential, LLC d/b/a Ziegler Cooper Architects ("ZCA") effective as of the date entered below. The Recipient and ZCA are sometimes referred to collectively as Parties and individually as a Party.

WHEREAS, ZCA prepares certain calculations, drawings and specifications in electronic format for use in connection with its various design projects ("Electronic Data");

WHEREAS, Recipient may from time to time request copies of portions of the Electronic Data for specific projects and a limited non-exclusive license to use the Electronic Data in connection with the construction, maintenance, or use of the project for which the respective Electronic Data were prepared, but for no other purpose or for use by any other person or entity (each such individual request being referred to as a "Project Electronic Data Request");

WHEREAS, The Parties intend that each Project Electronic Data Request shall incorporate this Umbrella Agreement without repeating it at length and regardless of whether this Umbrella Agreement is referenced in the Project Electronic Data Request.

NOW, THEREFORE, in consideration of Recipient being allowed to use ZCA's Electronic Data, the covenants of this Umbrella Agreement, Recipient's representations, and other good and valuable consideration, the receipt and sufficiency of which the Parties acknowledge, ZCA and Recipient agree as follows:

1. Requests

(a) Recipient shall send a written Project Electronic Data Request seeking Electronic Data for the particular project. Each request shall provide: (i) the project and building name; (ii) the recipient's specific planned use for the Electronic Data on the project (*e.g.,* to prepare submittals or backgrounds); (iii) the identity of the building owner, building management company and the tenant; (iv) the identity of Recipient's client or customer. A Project Electronic Data Request sent by email shall be considered a written request.

(b) Unless expressly excluded by the parties, this Umbrella Agreement is incorporated by reference into each and every Project Electronic Data Request Recipient makes regardless of whether this Umbrella Agreement is expressly referenced. Each Project Electronic Data Request that ZCA accepts by providing Electronic Data, together with this Umbrella Agreement, form a separate contract with respect to the project for which the Project Electronic Data Request is made.

(c) Any copy of the Electronic Data ZCA provides shall be in the format and software ZCA customarily uses.

(d) In the event that terms of this Umbrella Agreement and terms of a corresponding Project Electronic Data Request are contradictory, this Umbrella Agreement shall take precedence.

(e) ZCA may require additional information before granting the Project Electronic Data Request and may reject any Project Electronic Data Request in ZCA's sole judgment and discretion.

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2. Representations Recipient makes the following representations to ZCA as an inducement for ZCA to provide Electronic Data:

   (a) Recipient acknowledges that the conversion of information and data from the system and format used by ZCA to an alternative system or format may result in the introduction of inexactitudes, anomalies, and errors.

   (b) Recipient acknowledges that the originals maintained by ZCA of any Electronic Data received shall govern in the event of any inconsistency between information delivered to Recipient and such originals maintained by ZCA.

   (c) Recipient accepts the Electronic Data "as is," and ZCA is under no obligation to inform Recipient about changes in the Electronic Data or to correct, update, enhance, or maintain the Electronic Data for Recipient.

   (d) Recipient accepts the Electronic Data free of any representation or warranty that the Electronic Data is complete, free of defects, accurate or appropriate for any particular use by Recipient, now or in the future.

   (e) Recipient acknowledges that no client or consultant relationship between ZCA and Recipient has been or will be created by, through or in connection with this instrument.

   (f) Recipient acknowledges that ZCA enters into this Umbrella Agreement and provides Electronic Data to Recipient in reliance upon Recipient's agreements and representations contained herein and would not have entered into this Umbrella Agreement or provided any Electronic Data to Recipient but for Recipient having made such agreements and representations.

3. License The Electronic Data prepared by ZCA are instruments of professional service intended to be used solely for the construction, maintenance and use of the project for which they were prepared in a manner determined by ZCA. ZCA grants to Recipient, with respect to the Electronic Data ZCA provides to Recipient, a limited, non-exclusive license to use such Electronic Data in connection with the construction, maintenance, or use of the project for which the respective Electronic Data were prepared only. Such Electronic Data shall remain the property of ZCA. ZCA shall be deemed the author of all Electronic Data and shall retain all common law, statutory and other reserved rights, including any copyright, therein. If any portions of the Electronic Data is necessary for support of project submittal requirements by the Recipient, such reproduction shall bear the Recipient's stamp "Reproduction for limited purpose use in support of Project Submittal" and shall not serve as a substitute for shop drawings or engineered design submittals required pursuant to the project agreement, related documents, including specifications and by incorporated codes, regulations or regulatory requirements.

4. Waiver of Claims Recipient waives and releases ZCA, and its officers, directors, principals, consultants, employees, representatives, agents, and successors from every Claim, as defined herein, **REGARDLESS OF WHETHER OR NOT ANY SUCH CLAIM RESULTS OR IS ALLEGED TO RESULT, IN WHOLE OR IN PART, FROM ANY ACT, OMISSION, NEGLIGENCE, NEGLIGENT MISREPRESENTATION, OR BREACH OF CONTRACT OR OTHER LEGAL DUTY OF ZCA, AND REGARDLESS OF WHETHER OR NOT ANY SUCH CLAIM IS KNOWN OR UNKNOWN AS OF THE DATE THE ELECTRONIC DATA IS PROVIDED TO RECIPIENT.**

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ELECTRONIC DATA TRANSFER UMBRELLA AGREEMENT

5. Indemnity Recipient acknowledges that Recipient's use of, misuse of, use for an unanticipated purpose of, additions to, changes to, or modifications of the Electronic Data may result in adverse consequences to ZCA that ZCA can neither predict nor control. Therefore, Recipient agrees to hold harmless, defend and indemnify ZCA and its officers, directors, partners, principals, shareholders, employees, representatives, agents, successors and consultants (the "Indemnitees") from and against all claims, damages, and loss of any nature (including without limitation, personal injury, death, property damage, or economic loss) and any expense (including without limitation reasonable attorney's and experts' fees and costs of litigation and defense) which arise, in whole or in part, in connection with any Electronic Data provided to the Recipient, any error, discrepancy, inaccuracy, variation or other defect in the Electronic Data, or the use, transmission, conversion, modification, formatting, integrity, or security of the Electronic Data (collectively "Claim**"), REGARDLESS OF WHETHER OR NOT ANY SUCH CLAIM RESULTS OR IS ALLEGED TO RESULT, IN WHOLE OR IN PART, FROM ANY ACT, OMISSION, NEGLIGENCE, NEGLIGENT MISREPRESENTATION, OR BREACH OF CONTRACT OR OTHER LEGAL DUTY OF ANY INDEMNITEE, AND REGARDLESS OF WHETHER OR NOT ANY SUCH CLAIM IS KNOWN OR UNKNOWN AS OF THE DATE THE ELECTRONIC DATA IS PROVIDED TO RECIPIENT**. This indemnity provision shall survive termination or expiration of this Umbrella Agreement or any license granted by this Umbrella Agreement. The defense obligation shall be fulfilled by monthly reimbursement to any Indemnitee for counsel selected by the Indemnitee.

6. Miscellaneous

(a) Recipient agrees to be bound by any confidentiality requirements ZCA shall impose with respect to the respective Electronic Data provided.

(b) This Umbrella Agreement may be terminated by either Party upon thirty (30) days' written notice to the other Party for convenience and without cause. Such termination shall not terminate any contract of which it became a part; provided, however, ZCA may terminate the use license granted in any such contract in the event of recipient's breach of this Umbrella Agreement or any contract of which it is a part.

(c) In the event any one or more provisions of this Umbrella Agreement or any contract of which it is a part, or the application thereof to any person or circumstance, shall for any reason be held invalid, illegal or unenforceable in any respect, any such invalidity, illegality or unenforceability shall be deemed stricken and shall not affect any other provision of this Umbrella Agreement, any contract of which it is a part or the application of such provisions to other persons or circumstances, and the balance of this Umbrella Agreement or any contract of which it is a part shall be enforced to the greatest extent permitted by law.

(d) This Agreement shall be governed by the laws of the State of Texas. Any disputes arising out of, concerning or related to this Umbrella Agreement or any contract of which it is a part shall be resolved in a court of competent jurisdiction exclusively in Harris County, Texas.

(e) Recipient agrees that a violation or threat of violation by Recipient of the terms of this Umbrella Agreement or any contract of which it is a part may cause irreparable harm to ZCA that cannot be adequately compensated by monetary damages and agrees that ZCA may seek injunctive relief without bond to enforce its terms.

The Parties duly execute this Electronic Data Transfer Umbrella Agreement as of October 9, 2019.

ELECTRONIC DATA TRANSFER UMBRELLA AGREEMENT

RECIPIENT

_____

By:
Its:

SECTION 014000 - QUALITY REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes administrative and procedural requirements for quality assurance and quality control.

B. Testing and inspecting services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements.

1. Specific quality-assurance and -control requirements for individual construction activities are specified in the Sections that specify those activities. Requirements in those Sections may also cover production of standard products.
2. Specified tests, inspections, and related actions do not limit Contractor's other quality-assurance and -control procedures that facilitate compliance with the Contract Document requirements.
3. Requirements for Contractor to provide quality-assurance and -control services required by Architect, Owner, Commissioning Authority, or authorities having jurisdiction are not limited by provisions of this Section.

C. Related Requirements:

1. Divisions 02 through 33 Sections for specific test and inspection requirements.

1.3 DEFINITIONS

A. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and substantiate that proposed construction will comply with requirements.

B. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that actual products incorporated into the Work and completed construction comply with requirements. Services do not include contract enforcement activities performed by Architect or Construction Manager.

C. Mockups: Full-size physical assemblies that are constructed on-site. Mockups are constructed to verify selections made under Sample submittals; to demonstrate aesthetic effects and, where indicated, qualities of materials and execution; to review coordination, testing, or operation; to

D. show interface between dissimilar materials; and to demonstrate compliance with specified installation tolerances. Mockups are not Samples. Unless otherwise indicated, approved mockups establish the standard by which the Work will be judged.

1. Integrated Exterior Mockups: Mockups of the exterior envelope erected separately from the building but on Project site, consisting of multiple products, assemblies, and subassemblies.
2. Unit Mockups: Mockups of typical interior spaces complete with wall, floor, and ceiling finishes, doors, windows, millwork, casework, specialties, furnishings and equipment, and lighting. Include locations of all furr downs, exhaust duct runs, supply and return air locations, down lighting, track lighting, ceiling fans, convenience outlet locations, sprinkler head locations, thermostat locations, and a validation of compliance with ADA/Fair Housing requirements.

E. Source Quality-Control Testing: Tests and inspections that are performed at the source, e.g., plant, mill, factory, or shop.

F. Field Quality-Control Testing: Tests and inspections that are performed on-site for installation of the Work and for completed Work.

G. Testing Agency: An entity engaged to perform specific tests, inspections, or both. Testing laboratory shall mean the same as testing agency.

H. Installer/Applicator/Erector: Contractor or another entity engaged by Contractor as an employee, Subcontractor, or Sub-subcontractor, to perform a particular construction operation, including installation, erection, application, and similar operations.

1. Use of trade-specific terminology in referring to a trade or entity does not require that certain construction activities be performed by accredited or unionized individuals, or that requirements specified apply exclusively to specific trade(s)..

I. Experienced: When used with an entity or individual, "experienced" means having successfully completed projects similar in nature, size, and extent to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.

1.4 CONFLICTING REQUIREMENTS

A. Referenced Standards: If compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer conflicting requirements that are different, but apparently equal, to Owner/Architect for a decision before proceeding.

B. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. Refer uncertainties to Architect for a decision before proceeding.

1.5 ACTION SUBMITTALS

A. For integrated exterior and /or laboratory mockups, provide plans, sections, and elevations, indicating materials and size of mockup construction.

1. Indicate manufacturer and model number of individual components.
2. Provide axonometric drawings for conditions difficult to illustrate in two dimensions.

1.6 INFORMATIONAL SUBMITTALS

A. Contractor's Statement of Responsibility: When required by authorities having jurisdiction, submit copy of written statement of responsibility sent to authorities having jurisdiction before starting work on the following systems.

1.7 REPORTS AND DOCUMENTS

A. Test and Inspection Reports: Prepare and submit certified written reports specified in other Sections. Include the following:

1. Date of issue.
2. Project title and number.
3. Name, address, and telephone number of testing agency.
4. Dates and locations of samples and tests or inspections.
5. Names of individuals making tests and inspections.
6. Description of the Work and test and inspection method.
7. Identification of product and Specification Section.
8. Complete test or inspection data.
9. Test and inspection results and an interpretation of test results.
10. Record of temperature and weather conditions at time of sample taking and testing and inspecting.
11. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
12. Name and signature of laboratory inspector.
13. Recommendations on retesting and reinspection.

B. Manufacturer's Technical Representative's Field Reports: Prepare written information documenting manufacturer's technical representative's tests and inspections specified in other Sections. Include the following:

1. Name, address, and telephone number of technical representatives making report.
2. Statement on condition of substrates and their acceptability for installation of product.
3. Statement that products at Project site comply with requirements.
4. Summary of installation procedures being followed, whether they comply with requirements and, if not, what corrective action was taken.
5. Results of operational and other tests and a statement of whether observed performance complies with requirements.

6. Statement whether conditions, products, and installation will affect warranty.
7. Other required items indicated in individual Specification Sections.

C. Factory-Authorized Service Representative's Reports: Prepare written information documenting manufacturer's factory-authorized service representative's tests and inspections specified in other Sections. Include the following:

1. Name, address, and telephone number of factory-authorized service representative making report.
2. Statement that equipment complies with requirements.
3. Results of operational and other tests and a statement of whether observed performance complies with requirements.
4. Statement whether conditions, products, and installation will affect warranty.
5. Other required items indicated in individual Specification Sections.

1.8 QUALITY ASSURANCE

A. General: Qualifications paragraphs in this article establish the minimum qualification levels required; individual Specification Sections specify additional requirements.

B. Manufacturer Qualifications: A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.

C. Fabricator Qualifications: A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.

D. Installer Qualifications: A firm or individual experienced in installing, erecting, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.

E. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of the system, assembly, or product that are similar in material, design, and extent to those indicated for this Project.

F. Specialists: Certain Specification Sections require that specific construction activities shall be performed by entities who are recognized experts in those operations. Specialists shall satisfy qualification requirements indicated and shall be engaged for the activities indicated.

1. Requirements of authorities having jurisdiction shall supersede requirements for specialists.

G. Testing Agency Qualifications: An independent agency with the experience and capability to conduct testing and inspecting indicated, as documented according to ASTM Standards; and with additional qualifications specified in individual Sections; and, where required by authorities having jurisdiction, that is acceptable to authorities.

H. Manufacturer's Technical Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to observe and inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.

I. Factory-Authorized Service Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.

J. Mockups: Before installing portions of the Work requiring mockups, build mockups for each form of construction and finish required to comply with the following requirements, using materials indicated for the completed Work:

1. Build mockups in location and of size indicated or, if not indicated, as directed by owner.
2. Notify owner seven days in advance of dates and times when mockups will be constructed.
3. Employ supervisory personnel who will oversee mockup construction. Employ workers that will be employed during the construction at Project.
4. Demonstrate the proposed range of aesthetic effects and workmanship.
5. Obtain owner's approval of mockups before starting work, fabrication, or construction.
6. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.
7. Demolish and remove mockups when directed unless otherwise indicated.

1.9 QUALITY CONTROL

A. Owner Responsibilities: Where quality-control services are indicated as Owner's responsibility, Owner will engage a qualified testing agency to perform these services.

1. Owner will furnish Contractor with names, addresses, and telephone numbers of testing agencies engaged and a description of types of testing and inspecting they are engaged to perform.
2. Payment for these services will be made from testing and inspecting allowances, as authorized by Change Orders.
3. Costs for retesting and reinspecting construction that replaces or is necessitated by work that failed to comply with the Contract Documents will be charged to Contractor**,** and the Contract Sum will be adjusted by Change Order.

B. Contractor Responsibilities: Tests and inspections are Contractor's responsibility.

1. Unless otherwise indicated, provide quality-control services specified and those required by authorities having jurisdiction. Perform quality-control services required of Contractor by authorities having jurisdiction, whether specified or not.

2. Where services are indicated as Contractor's responsibility, engage a qualified testing agency to perform these quality-control services.

3. Notify testing agencies at least 24 hours in advance of time when Work that requires testing or inspecting will be performed.
4. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.

C. Manufacturer's Field Services: Where indicated, engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including service connections. Report results in writing as specified in Division 01 Section "Submittal Procedures."

D. Manufacturer's Technical Services: Where indicated, engage a manufacturer's technical representative to observe and inspect the Work. Manufacturer's technical representative's services include participation in preinstallation conferences, examination of substrates and conditions, verification of materials, observation of Installer activities, inspection of completed portions of the Work, and submittal of written reports.

E. Retesting/Reinspecting: Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and reinspecting, for construction that replaced Work that failed to comply with the Contract Documents.

F. Testing Agency Responsibilities: Cooperate with owner and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.

1. Notify owner and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
2. Determine the location from which test samples will be taken and in which in-situ tests are conducted.
3. Conduct and interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from requirements.
4. Submit a certified written report, in duplicate, of each test, inspection, and similar quality-control service through Contractor.
5. Do not release, revoke, alter, or increase the Contract Document requirements or approve or accept any portion of the Work.
6. Do not perform any duties of Contractor.

G. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and -control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.

1.10 SPECIAL TESTS AND INSPECTIONS

A. Special Tests and Inspections: Owner will engage a qualified testing agency and /or special inspector to conduct special tests and inspections required by authorities having jurisdiction as the responsibility of Owner as follows:

B. Special Tests and Inspections: Conducted by a qualified testing agency and/or special inspector as required by authorities having jurisdiction, as indicated in individual Specification Sections.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 TEST AND INSPECTION LOG

A. Test and Inspection Log: Prepare a record of tests and inspections. Include the following:

1. Date test or inspection was conducted.
2. Description of the Work tested or inspected.
3. Date test or inspection results were transmitted to owner.
4. Identification of testing agency or special inspector conducting test or inspection.

B. Maintain log at Project site. Post changes and revisions as they occur. Provide access to test and inspection log for owner's reference during normal working hours.

3.2 REPAIR AND PROTECTION

A. General: On completion of testing, inspecting, sample taking, and similar services, repair damaged construction and restore substrates and finishes.

1. Provide materials and comply with installation requirements specified in other Specification Sections or matching existing substrates and finishes. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible. Comply with the Contract Document requirements for cutting and patching in Division 01 Section "Execution."

B. Protect construction exposed by or for quality-control service activities.

C. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

END OF SECTION 014000

SECTION 014200 - REFERENCES

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.

1.2 DEFINITIONS

A. General: Basic Contract definitions are included in the Conditions of the Contract.

B. "Approved": When used to convey Architect's action on Contractor's submittals, applications, and requests, "approved" is limited to Architect's duties and responsibilities as stated in the Conditions of the Contract.

C. "Directed": A command or instruction by Architect. Other terms including "requested," "authorized," "selected," "required," and "permitted" have the same meaning as "directed."

D. "Indicated": Requirements expressed by graphic representations or in written form on Drawings, in Specifications, and in other Contract Documents. Other terms including "shown," "noted," "scheduled," and "specified" have the same meaning as "indicated."

E. "Regulations": Laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, and rules, conventions, and agreements within the construction industry that control performance of the Work.

F. "Furnish": Supply and deliver to Project site, ready for unloading, unpacking, assembly, installation, and similar operations.

G. "Install": Operations at Project site including unloading, temporarily storing, unpacking, assembling, erecting, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations.

H. "Provide": Furnish and install, complete and ready for the intended use.

I. "Project Site": Space available for performing construction activities. The extent of Project site is shown on Drawings and may or may not be identical with the description of the land on which Project is to be built.

1.3 INDUSTRY STANDARDS

A. Applicability of Standards: Unless the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the Contract Documents to the extent referenced. Such standards are made a part of the Contract Documents by reference.

B. Publication Dates: Comply with standards in effect as of date of the Contract Documents unless otherwise indicated.

C. Copies of Standards: Each entity engaged in construction on Project should be familiar with industry standards applicable to its construction activity. Copies of applicable standards are not bound with the Contract Documents.

1. Where copies of standards are needed to perform a required construction activity, obtain copies directly from publication source.

1.4 ABBREVIATIONS AND ACRONYMS

A. Industry Organizations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities indicated in Thomson Gale's "Encyclopedia of Associations" or in Columbia Books' "National Trade & Professional Associations of the U.S."

B. Industry Organizations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. Names, telephone numbers, and Web sites are subject to change and are believed to be accurate and up-to-date as of the date of the Contract Documents.

AA	Aluminum Association (The) www.aluminum.org	(703) 358-2960
AABC	Associated Air Balance Council www.aabchq.com	(202) 737-0202
AAMA	American Architectural Manufacturers Association www.aamanet.org	
AASHTO	American Association of State Highway and Transportation Officials	(202) 624-5800
AATCC	American Association of Textile Chemists and Colorists www.aatcc.org	(919) 549-8141
ABAA	Air Barrier Association of America www.airbarrier.org	(866) 956-5888
ABMA	American Bearing Manufacturers Association www.abma-dc.org	
ACI	American Concrete Institute	(248) 848-3700

ACPA	American Concrete Pipe Association www.concrete-pipe.org	(972) 506-7216
AEIC	Association of Edison Illuminating Companies, Inc. (The) www.aeic.org	(205) 257-2530
AF&PA	American Forest and Paper Association www.afandpa.org	(202) 463-2700
AGA	American Gas Association	(202) 824-7000
AHAM	Association of Home Appliance Manufacturers www.aham.org	(202) 872-5955
AHRI	Air-Conditioning, Heating, and Refrigeration Institute, The www.ahrinet.org	(703) 524-8800
AI	www.asphaltinstitute.org	
AIA	American Institute of Architects (The)	(800) 242-3837
AISC	American Institute of Steel Construction www.aisc.org	(800) 644-2400 (312) 670-2400
AISI	American Iron and Steel Institute www.steel.org	(202) 452-7100
AITC	www.aitc-glulam.org	
ALSC	American Lumber Standard Committee, Incorporated	(301) 972-1700
AMCA	Air Movement and Control Association International, Inc. www.amca.org	(847) 394-0150
ANSI	American National Standards Institute www.ansi.org	(202) 293-8020
AOSA	www.aosaseed.com	
APA	APA - The Engineered Wood Association	(253) 565-6600

APA	Architectural Precast Association www.archprecast.org	(239) 454-6989
API	American Petroleum Institute www.api.org	(202) 682-8000
ARI	Air-Conditioning and Refrigeration Institute www.ari.org	
ARMA	Asphalt Roofing Manufacturers Association	(202) 207-0917
ASCE	American Society of Civil Engineers www.asce.org	(800) 548-2723 (703) 295-6300
ASCE/SEI	American Society of Civil Engineers/Structural Engineering Institute (See ASCE)	
ASHRAE	www.ashrae.org	(404) 636-8400
ASME	American Society of Mechanical Engineers International www.asme.org	(800) 843-2763
ASSE	American Society of Sanitary Engineering	(440) 835-3040
ASTM	ASTM International (American Society for Testing and Materials International)	(610) 832-9500
ATIS	Alliance for Telecommunications Industry Solutions www.atis.org	(202) 628-6380
AWCMA	American Window Covering Manufacturers Association (Now WCMA)	
AWCI	Association of Wall and Ceiling Industry www.awci.org	
AWI	Architectural Woodwork Institute	(571) 323-3636
AWPA	American Wood Protection Association (Formerly: American Wood Preservers' Association)	(205) 733-4077
AWS	American Welding Society	(800) 443-9353

	www.aws.org	(305) 443-9353
AWWA	American Water Works Association www.awwa.org	(800) 926-7337 (303) 794-7711
BHMA	www.buildershardware.com	
BIA	Brick Industry Association (The)	(703) 620-0010
BICSI	Building Industry Consulting Service International www.bicsi.org (Communications)	(800) 242-7405 (813) 979-1991
BIFMA	BIFMA International (Business and Institutional Furniture Manufacturer's Association International) www.bifma.com	(616) 285-3963
BISSC	Baking Industry Sanitation Standards Committee www.bissc.org	(866) 342-4772
CCC	www.carpetcushion.org	
CDA	Copper Development Association	(800) 232-3282
CEA	Canadian Electricity Association www.canelect.ca	(613) 230-9263
CEA	Consumer Electronics Association www.ce.org	(866) 858-1555 (703) 907-7600
CFFA	www.chemicalfabricsandfilm.com	
CGA	Compressed Gas Association	(703) 788-2700
CIMA	Cellulose Insulation Manufacturers Association www.cellulose.org	(888) 881-2462 (937) 222-2462
CISCA	Ceilings & Interior Systems Construction Association www.cisca.org	(630) 584-1919
CISPI	Cast Iron Soil Pipe Institute www.cispi.org	
CLFMI	Chain Link Fence Manufacturers Institute	(301) 596-2583

CPA	Composite Panel Association www.pbmdf.com	(703) 724-1128
CRI	Carpet and Rug Institute (The) www.carpet-rug.com	(800) 882-8846 (706) 278-3176
CRRC	www.coolroofs.org	(510) 485-7175
CRSI	Concrete Reinforcing Steel Institute	(847) 517-1200
CRRC	Cool Roof Rating Council www.coolroofs.org	(866) 465-2523 (510) 485-7175
CSA	Canadian Standards Association www.csa.ca	(800) 463-6727 (416) 747-4000
CSA	(Formerly: IAS - International Approval Services) www.csa-international.org	(416) 747-4000
CSI	www.csinet.org	(703) 684-0300
CSSB	Cedar Shake & Shingle Bureau	(604) 820-7700
CTI	Cooling Technology Institute (Formerly: Cooling Tower Institute)	(281) 583-4087
DHI	Door and Hardware Institute www.dhi.org	(703) 222-2010
ECA	Electrical Components Association www.ec-central.org	(703)907-8024
EIA	US Energy Information Administration www.eia.gov	
EIMA	EIFS Industry Members Association	(800) 294-3462
EJCDC	Engineers Joint Contract Documents Committee http://content.asce.org/ejcdc/	(703) 295-6000
EJMA	Expansion Joint Manufacturers Association, Inc.	(914) 332-0040

	www.ejma.org	
ESD	(Electrostatic Discharge Association) www.esda.org	
ETL SEMCO	(Formerly: ITS - Intertek Testing Service NA) www.intertek-etlsemko.com	
FIBA	(The International Basketball Federation) www.fiba.com	
FIVB	(The International Volleyball Federation) www.fivb.ch	
FM Approvals	www.fmglobal.com	
FM Global	FM Global www.fmglobal.com	(401) 275-3000
FRSA	Florida Roofing, Sheet Metal & Air Conditioning Contractors Association, Inc.	(407) 671-3772
FSA	Fluid Sealing Association www.fluidsealing.com	(610) 971-4850
FSC	Forest Stewardship Council www.fsc.org	49 228 367 66 0
GA	www.gypsum.org	(301) 277-8686
GANA	Glass Association of North America	(785) 271-0208
GRI	(Part of GSI)	
GS	www.greenseal.org	
GSI	Geosynthetic Institute	(610) 522-8440
HI	Hydronics Institute	(908) 464-8200

	www.gamanet.org	
HI/GAMA	Hydronics Institute/Gas Appliance Manufacturers Association Division of Air-Conditioning, Heating, and Refrigeration Institute (AHRI) www.ahrinet.org	(908) 464-8200
HMMA	Hollow Metal Manufacturers Association (Part of NAAMM)	
HPVA	Hardwood Plywood and Veneer Association www.hpva.org	
HPW	H. P. White Laboratory, Inc. Ballistic Testing	(410) 838-6550
IAPSC	International Association of Professional Security Consultants www.iapsc.org	(515) 282-8192
ICBO	International Conference of Building Officials www.iccsafe.org	(888) 422-7233
ICEA	Insulated Cable Engineers Association www.icea.net	
ICRI	International Concrete Repair Institute, Inc.	(847) 827-0830
ICPA	International Cast Polymer Association www.icpa-hq.org	(703) 525-0320
IEC	International Electrotechnical Commission www.iec.ch	41 22 919 02 11
IEEE	Institute of Electrical and Electronics Engineers www.ieee.org	
IES	Illuminating Engineering Society of North America	(703) 525-0320
IEST	Institute of Environmental Sciences and Technology www.iest.org	(847) 255-1561
IGMA	Insulating Glass Manufacturers Alliance www.igmaonline.org	(613) 233-1510

ILI	Indiana Limestone Institute of America www.iliai.com	
ISA	Instrumentation, Systems, and Automation Society, The	(919) 549-8411
ISO	International Organization for Standardization www.iso.ch	41 22 749 01 11
ISSFA	International Solid Surface Fabricators Association www.issfa.net	(877) 464-7732 (801) 341-7360
ITS	(Now ETL SEMCO)	
ITU	International Telecommunication Union	41 22 730 51 11
KCMA	Kitchen Cabinet Manufacturers Association www.kcma.org	(703) 264-1690
LGSEA	Light Gauge Steel Engineers Association www.arcat.com	(202) 263-4488
LMA	(Now part of CPA)	
LPI	Lightning Protection Institute	(800) 488-6864
MBMA	Metal Building Manufacturers Association www.mbma.com	(216) 241-7333
MCA	Metal Construction Association www.metalconstruction.org	(847) 375-4718
MFMA	www.maplefloor.org	
MFMA	Metal Framing Manufacturers Association, Inc.	(312) 644-6610
MH	Material Handling (Now MHIA)	
MHIA	Material Handling Industry of America www.mhia.org	(800) 345-1815 (704) 676-1190
MIA	www.marble-institute.com	

MPI	Master Painters Institute	(888) 674-8937
MSS	Manufacturers Standardization Society of The Valve and Fittings Industry Inc. www.mss-hq.com	(703) 281-6613
NAAMM	National Association of Architectural Metal Manufacturers www.naamm.org	(630) 942-6591
NACE	(National Association of Corrosion Engineers International) www.nace.org	(281) 228-6200
NADCA	The National Air Duct Cleaners Association www.nadca.com	
NAGWS	National Association for Girls and Women in Sport	(800) 213-7193, ext. 453
NAIMA	North American Insulation Manufacturers Association www.naima.org	(703) 684-0084
NBGQA	National Building Granite Quarries Association, Inc. www.nbgqa.com	(800) 557-2848
NCAA	www.ncaa.org	
NCMA	National Concrete Masonry Association	(703) 713-1900
NCTA	National Cable & Telecommunications Association www.ncta.com	(202) 222-2300
NEBB	National Environmental Balancing Bureau www.nebb.org	(301) 977-3698
NECA	National Electrical Contractors Association www.necanet.org	
NeLMA	Northeastern Lumber Manufacturers' Association	(207) 829-6901
NEMA	National Electrical Manufacturers Association www.nema.org	(703) 841-3200
NETA	InterNational Electrical Testing Association www.netaworld.org	(888) 300-6382 (269) 488-6382

NFHS	National Federation of State High School Associations www.nfhs.org	
NFPA	National Fire Protection Association NFPA www.nfpa.org	(800) 344-3555
NFRC	National Fenestration Rating Council	(301) 589-1776
NGA	National Glass Association www.glass.org	(866) 342-5642 (703) 442-4890
NHLA	National Hardwood Lumber Association www.natlhardwood.org	(800) 933-0318 (901) 377-1818
NLGA	National Lumber Grades Authority www.nlga.org	
NOFMA	NOFMA: The Wood Flooring Manufacturers Association www.nofma.org	(901) 526-5016
NOMMA	National Ornamental & Miscellaneous Metals Association	(888) 516-8585
NRCA	National Roofing Contractors Association www.nrca.net	(800) 323-9545 (847) 299-9070
NRMCA	National Ready Mixed Concrete Association www.nrmca.org	(888) 846-7622 (301) 587-1400
NSF	(National Sanitation Foundation International) www.nsf.org	(734) 769-8010
NSSGA	The National Stone, Sand and Gravel Association www.nssga.org	(703) 525-8788
NTMA	National Terrazzo & Mosaic Association, Inc. (The)	(800) 323-9736
NWFA	National Wood Flooring Association www.nwfa.org	(800) 422-4556 (636) 519-9663
PCI	Precast/Prestressed Concrete Institute www.pci.org	(312) 786-0300
PDI	Plumbing & Drainage Institute www.pdionline.org	(978) 557-0720

PGI	PVC Geomembrane Institute	(217) 333-3929
PTI	Post-Tensioning Institute www.post-tensioning.org	(248) 848-3180
RCSC	Research Council on Structural Connections www.boltcouncil.org	
RFCI	Resilient Floor Covering Institute www.rfci.com	(706) 882-3833
RIS	Redwood Inspection Service	
SAE	Society of Automotive Engineers SAE International www.sae.org	(877) 606-7323 (724) 776-4841
SCAQMD	South Coast Air Quality Management District www.aqmd.com	(909) 396-2000
SCTE	Society of Cable Telecommunications Engineers www.scte.org	(610) 363-6888
SDI	Steel Deck Institute	(847) 458-4647
SDI	Steel Door Institute www.steeldoor.org	(440) 899-0010
SEFA	Scientific Equipment and Furniture Association www.sefalabs.com	(877) 294-5424 (516) 294-5424
SEI/ASCE	American Society of Civil Engineers (See ASCE)	
SIA	Security Industry Association	(866) 817-8888
SJI	Steel Joist Institute www.steeljoist.org	(843) 626-1995
SMA	Screen Manufacturers Association www.smacentral.org	(561) 533-0991
SMACNA	Sheet metal and Air Conditioning Contractors National Association www.smacna.org	

SMPTE	Society of Motion Picture & Television Engineers www.smpte.org	
SPFA	Spray Polyurethane Foam Alliance www.sprayfoam.org	(800) 523-6154
SPIB	Southern Pine Inspection Bureau (The)	(850) 434-2611
SPRI	Single Ply Roofing Industry www.spri.org	(781) 647-7026
SSINA	Specialty Steel Industry of North America www.ssina.com	(800) 982-0355 (202) 342-8630
SSPC	The Society of Protective Coatings www.sspc.org	(412) 281-2331
STI	Steel Tank Institute	(847) 438-8265
SWI	Steel Window Institute www.steelwindows.com	(216) 241-7333
SWPA	Submersible Wastewater Pump Association www.swpa.org	(847) 681-1868
TCA	www.tilt-up.org	
TCNA	Tile Council of North America, Inc.	(864) 646-8453
TEMA	Tubular Exchanger Manufacturers Association www.tema.org	(914) 332-0040
TIA/EIA	Telecommunications Industry Association/Electronic Industries Alliance www.tiaonline.org	(703) 907-7700
TMS	www.masonrysociety.org	
TPI	Truss Plate Institute, Inc.	(703) 683-1010
TPI	Turfgrass Producers International www.turfgrasssod.org	(800) 405-8873 (847) 649-5555

TRI	Tile Roofing Institute www.tileroofing.org	(312) 670-4177
UL	www.ul.com	(847) 272-8800
UNI	Uni-Bell PVC Pipe Association	(972) 243-3902
USAV	USA Volleyball www.usavolleyball.org	(888) 786-5539 (719) 228-6800
USGBC	U.S. Green Building Council www.usgbc.org	(800) 795-1747
USITT	US Institute for Theatre Technology www.usitt.org	(315) 463-6463
WASTEC	Waste Equipment Technology Association	(800) 424-2869
WCLIB	West Coast Lumber Inspection Bureau www.wclib.org	(800) 283-1486 (503) 639-0651
WCMA	Window Covering Manufacturers Association www.wcmanet.org	(212) 297-2122
WDMA	(Formerly: NWWDA - National Wood Window and Door Association) www.wdma.com	(312) 321-6802
WI	Woodwork Institute www.wicnet.org	
WMMPA	Wood Moulding & Millwork Producers Association	(800) 550-7889
WSRCA	Western States Roofing Contractors Association www.wsrca.com	(800) 725-0333 (650) 570-5441
WWPA	Western Wood Products Association www.wwpa.org	(503) 224-3930

C. Code Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. Names, telephone numbers, and Web sites are subject to change and are believed to be accurate and up-to-date as of the date of the Contract Documents.

DIN www.din.de

IAPMO	International Association of Plumbing and Mechanical Officials	(909) 472-4100
ICC	International Code Council www.iccsafe.org	(888) 422-7233
ICC-ES	ICC Evaluation Service, Inc. www.icc-es.org	(800) 423-6587 (562) 699-0543

D. Federal Government Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. Names, telephone numbers, and Web sites are subject to change and are believed to be accurate and up-to-date as of the date of the Contract Documents.

COE	Army Corps of Engineers www.usace.army.mil	
CPSC	Consumer Product Safety Commission www.cpsc.gov	(800) 638-2772 (301) 504-7923
DOC	Department of Commerce www.commerce.gov	(202) 482-2000
DOD	Department of Defense http://dodssp.daps.dla.mil	(215) 697-6257
DOE	Department of Energy www.energy.gov	(202) 586-9220
EPA	Environmental Protection Agency	(202) 272-0167
FAA	Federal Aviation Administration www.faa.gov	(866) 835-5322
FCC	Federal Communications Commission www.fcc.gov	(888) 225-5322
FDA	www.fda.gov	
GSA	General Services Administration	(800) 488-3111
HUD	Department of Housing and Urban Development www.hud.gov	(202) 708-1112
LBL	Lawrence Berkeley National Laboratory www.lbl.gov	(510) 486-4000

NCHRP	(See TRB)	
NIST	National Institute of Standards and Technology	(301) 975-6478
OSHA	Occupational Safety & Health Administration www.osha.gov	(800) 321-6742 (202) 693-1999
PBS	Public Buildings Service (See GSA)	
PHS	http://www.hhs.gov/ophs/	
RUS	Rural Utilities Service	(202) 720-9540
SD	State Department www.state.gov	(202) 647-4000
TRB	Transportation Research Board http://gulliver.trb.org	(202) 334-2934
USDA	www.usda.gov	
USP	U.S. Pharmacopeia	(800) 227-8772
USPS	Postal Service www.usps.com	(202) 268-2000

E. Standards and Regulations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the standards and regulations in the following list. Names, telephone numbers, and Web sites are subject to change and are believed to be accurate and up-to-date as of the date of the Contract Documents.

ADAAG	Americans with Disabilities Act (ADA) Architectural Barriers Act (ABA) Accessibility Guidelines for Buildings and Facilities Available from U.S. Access Board www.access-board.gov	 (202) 272-0080
CFR	Code of Federal Regulations Available from Government Printing Office www.gpoaccess.gov/cfr/index.html	(866) 512-1800 (202) 512-1800

		(215) 697-2664
DOD	Department of Defense Military Specifications and Standards Available from Department of Defense Single Stock Point http://dodssp.daps.dla.mil	
DSCC	Defense Supply Center Columbus (See FS)	
FED-STD	Federal Standard (See FS)	
FS	Available from Department of Defense Single Stock Point http://dodssp.daps.dla.mil/	
	www.dsp.dla.mil	
	Available from General Services Administration	(202) 619-8925
	Available from National Institute of Building Sciences www.wbdg.org/ccb	(202) 289-7800
FTMS	Federal Test Method Standard (See FS)	
MIL		
MIL-STD	(See MILSPEC)	
MILSPEC	Available from Department of Defense Single Stock Point http://dodssp.daps.dla.mil	
UFAS	Available from Access Board www.access-board.gov	(202) 272-0080

F. State Government Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. Names, telephone numbers, and Web sites are subject to change and are believed to be accurate and up-to-date as of the date of the Contract Documents.

CBHF	www.dca.ca.gov/bhfti	(916) 574-2041
CCR	California Code of Regulations	(916) 323-6815
CDHS	California Department of Health Services www.dhcs.ca.gov	(916) 445-4171

CDPH California Department of Public Health, Indoor Air Quality Section
www.cal-iaq.org

CPUC www.cpuc.ca.gov

TFS Texas Forest Service
http://txforestservice.tamu.edu

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 014200

SECTION 01 45 33 – STRUCTURAL TESTS AND SPECIAL INSPECTIONS

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes administrative and procedural requirements required for compliance with the International Building Code, Chapter 17, Structural Tests and Special Inspections.

B. Structural testing and special inspection services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with other construction document requirements.
   1. Specific quality-assurance and control requirements for individual construction activities are specified in the Sections that specify those activities. Requirements in those Sections may also cover production of standard products.
   2. Specified tests, inspections, and related actions do not limit Contractor's other quality-assurance and control procedures that facilitate compliance with the construction document requirements.
   3. Requirements for Contractor to provide quality-assurance and control services required by architect, owner, or authorities having jurisdiction are not limited by provisions of this section.

C. The owner will engage one or more qualified special inspectors and / or testing agencies to conduct structural tests and special inspections specified in this section and related sections and as maybe specified in other divisions of these specifications.

D. Related Sections:
   1. Section 03 10 00 - Concrete
   2. Section 03 31 00 – Structural
   3. Section 04 20 00 – Concrete Masonry
   4. Section 05 40 00 – Cold-Formed Metal Framing.
   5. Section 31 20 00 – Earth Moving
   6. Reference Structural Drawings for additional information.

1.2 DEFINITIONS

A. Approved Agency: An established and recognized agency regularly engaged in conducting tests or furnishing inspection services, when such agency has been approved by the building official.

B. Construction Documents: Written, graphic and pictorial documents prepared or assembled for describing the design, location and physical characteristics of the elements of a project necessary for obtaining a building permit. Construction Documents include all supplemental instructions, sketches, addenda, and revisions to the drawings and specifications issued by the registered design professional beyond those issued for a building permit.

C. Shop Drawings / Submittal Data: Written, graphic and pictorial documents prepared and / or assembled by the Contractor based on the Construction Documents.

D. Structural Observation: Visual observation of the structural system by a representative of the registered design professional's office for general conformance to the approved construction documents. Structural observations are not considered part of the structural tests and special inspections and do not replace inspections and testing by the testing agency or special inspector.

E. Special Inspector: A qualified person who demonstrating competence, to the satisfaction of the code enforcement official and registered design professional in responsible change, for inspection of the particular type of construction or operation requiring special inspection. The special inspector shall be a licensed professional engineer or engineering intern or a qualified representative from the testing agency.

F. Special Inspection, Continuous: The full-time observation of work requiring special inspection by an approved special inspector who is present in the area where the work is being performed.

G. Special Inspection, Periodic: The part-time or intermittent observation of work requiring special inspection by an approved special inspector who is present in the area where the work has been or is being performed and at the completion of the work.

H. Testing Agency: A qualified materials testing laboratory under the responsible charge of a licensed professional engineer, approved by the code enforcement official and the registered design professional in responsible charge, the measure, examine, test, calibrate, or otherwise determine the characteristics or performance of construction materials and verify confirmation with construction documents.

1.3 QUALITY ASSURANCE

A. Testing Agency Qualifications:
   1. Minimum qualifications of inspection and testing agencies and their personnel shall comply with ASTM E329-03 Standard Specification for Agencies in the Testing and / or Inspection of Materials Used in Construction.
      a. Inspectors and individuals performing tests shall be certified for the work being performed as outlined in the appendix of the ASMT E329. Certification by organizations other than those listed must be submitted to the building official for consideration before proceeding with work.
   2. In addition to these requirements, local jurisdiction may have additional requirements. It is the responsibility of the testing and inspection agencies to meet local requirements and comply with local procedures.

1.4 CONFLICTING REQUIREMENTS, REPORTS, AND TEST RESULTS

A. General: If compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer uncertainties and requirements that are different, but apparently equal, to the registered design professional in responsible charge for a decision before proceeding.

B. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as

appropriate, for the context of requirements. Refer uncertainties to the registered design professional in responsible charge for a decision before proceeding.

C. The special inspector's reports and testing agencies results shall have precedence over reports and test results provided by the Contractor.

D. The construction documents and approved submittals are complementary, and that which is required by either is required by both. Any conflict or deviations found between the construction documents and approved shop drawing / submittal data shall be brought to the attention of the registered design professional in responsible charge by the contractor in writing. If deviations are acceptable to the design professional and owner, an approval of deviations will be provided in writing by the design professional and owner. Otherwise, contract documents shall take precedence.

1.5 SUBMITTALS BY SPECIAL INSPECTOR AND / OR TESTING AGENCY

A. Special inspectors shall keep and distribute records of inspections. The special inspector shall furnish inspection reports to the building official, and to the registered design professional in responsible charge, Contractor, architect, and owner. Reports shall indicate that work inspected was done in conformance to approved construction documents. Discrepancies shall be brought to the immediate attention of the Contractor for correction. If the discrepancies are not corrected, the discrepancies shall be brought to the attention of the building official and to the registered design professional in responsible charge prior to the completion of that phase of the work. A final report documenting required special inspections and correction of any discrepancies note in the inspections shall be submitted at a point in time agreed upon by the permit applicant and the building official prior to the start of work.
   1. Special inspection reports and test results shall include, but not limited to, the following:
      a. Date of inspection.
      b. Description of inspections or tests performed including location (reference grid lines, floors, elevations, etc.).
      c. Statement noting that the work, material, and / or product conform or does not conform to the construction document requirements.
         1) Name and signature of Contractor's representative who was notified of work, material, and / or products that do not meet the construction document requirements.
      d. Name and signature of special inspector and / or testing agency representative performing the work.

B. Schedule of Non-Compliant Work: Each agent shall maintain a log of work that does not meet the requirements of the construction documents. Include reference to original inspection / test report and subsequent dates of re-inspection / retesting.

C. Reports and tests shall be submitted within 1 week of inspection or test. Schedule of Non-Compliant Work shall be updated daily and submitted at monthly intervals.

D. Final Report of Special Inspections. Submitted by each agent listed in the schedule of Structural Testing and Special Inspections.

PART 2 – PRODUCTS (Not Used)

PART 3 – EXECUTION

3.1 CONTRACTOR'S RESPONSIBILITY

A. The Contractor shall coordinate the inspection and testing services with the progress of the work. The Contractor shall provide sufficient notice to allow proper scheduling of all personnel. The Contractor shall provide safe access for performing inspection and on site testing.

B The Contractor shall submit schedules to the owner, registered design professionals and testing and inspecting agencies. Schedules will note milestones and durations of time for materials requiring structural tests and special inspections.

C. The Contractor shall repair and / or replace work that does not meet the requirements of the construction documents.
   1. Contractor shall engage an engineer / architect to prepare repair and / or replacement procedures.
   2. Engineer / architect shall be registered in the state in which the project is located. Engineer shall be acceptable to the registered design professional in responsible charge, code enforcement official, and owner.
   3. Procedures shall be submitted for review and acceptance by the registered design professional in responsible change, code enforcement official, and owner before proceeding with corrective action.

D. The Contractor shall be responsible for costs of:
   1. Re-testing and re-inspection of materials, work, and / or products that do not meet the requirements of the construction documents and shop drawings / submittal data.
   2. Review of proposed repair and / or replacement procedures by the registered design professional in responsible charge and the inspectors and testing agencies.
   3. Repair or replacement of work that does not meet the requirements of the construction documents.

3.2 STRUCTURAL OBSERVATIONS

A. Structural observations may be made periodically as determined by the registered design professional in responsible charge.

3.3 TESTING AND INSPECTION

A. Testing and inspection shall be in accordance with the attached Schedule of Special Inspections.

B. Reference related specifications for the minimum level of inspections and testing. Provide additional inspections and testing as necessary to determine compliance with the construction drawings.

3.4 SCHEDULES AND FORMS (ATTACHED)

A. Statement of Special Inspections.

B. Schedule of Special Inspections.

C. Final Report of Special Inspections.

END OF SECTION

SECTION 015000 - TEMPORARY FACILITIES AND CONTROLS

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.

1.2 SUMMARY

A. Section includes requirements for temporary utilities, support facilities, and security and protection facilities.

B. Related Requirements:

1. Division 01 Section "Summary" for work restrictions and limitations on utility interruptions.
2. Division 31 Section "Dewatering" for disposal of ground water at Project site.
3. Division 32 Section "Asphalt Paving" for construction and maintenance of asphalt pavement for temporary roads and paved areas.
4. Division 32 Section "Concrete Paving" for construction and maintenance of cement concrete pavement for temporary roads and paved areas.

1.3 USE CHARGES

A. General: Installation and removal of and use charges for temporary facilities shall be included in the Contract Sum unless otherwise indicated. Allow other entities to use temporary services and facilities without cost, including, but not limited to, Owner's construction forces, Architect, testing agencies, and authorities having jurisdiction.

B. Sewer Service: Pay sewer-service use charges for sewer usage by all entities for construction operations.

C. Water Service: Pay water-service use charges for water used by all entities for construction operations.

D. Electric Power Service: Pay electric-power-service use charges for electricity used by all entities for construction operations.

E. Sewer, Water, and Electric Power Service: Use charges are specified in Division 01 Section "Multiple Contract Summary."

1.4 INFORMATIONAL SUBMITTALS

A. Site Plan: Show temporary facilities, utility hookups, staging areas, and parking areas for construction personnel.

B. Erosion- and Sedimentation-Control Plan: Show compliance with requirements of EPA Construction General Permit or authorities having jurisdiction, whichever is more stringent.

C. Fire-Safety Program: Show compliance with requirements of NFPA 241 and authorities having jurisdiction. Indicate Contractor personnel responsible for management of fire-prevention program.

D. Moisture-Protection Plan: Describe procedures and controls for protecting materials and construction from water absorption and damage.

1. Describe delivery, handling, and storage provisions for materials subject to water absorption or water damage.
2. Indicate procedures for discarding water-damaged materials, protocols for mitigating water intrusion into completed Work, and replacing water-damaged Work.
3. Indicate sequencing of work that requires water, such as sprayed fire-resistive materials, plastering, and terrazzo grinding, and describe plans for dealing with water from these operations. Show procedures for verifying that wet construction has dried sufficiently to permit installation of finish materials.

E. Dust- and HVAC-Control Plan: Submit coordination drawing and narrative that indicates the dust- and HVAC-control measures proposed for use, proposed locations, and proposed time frame for their operation. Identify further options if proposed measures are later determined to be inadequate. Include the following:

1. Locations of dust-control partitions at each phase of work.
2. HVAC system isolation schematic drawing.
3. Location of proposed air-filtration system discharge.
4. Waste handling procedures.
5. Other dust-control measures.

1.5 QUALITY ASSURANCE

A. Electric Service: Comply with NECA, NEMA, and UL standards and regulations for temporary electric service. Install service to comply with NFPA 70.

B. Tests and Inspections: Arrange for authorities having jurisdiction to test and inspect each temporary utility before use. Obtain required certifications and permits.

C. Accessible Temporary Egress: Comply with applicable provisions in the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines and ICC/ANSI A117.1.

1.6 PROJECT CONDITIONS

A. Temporary Use of Permanent Facilities: Engage Installer of each permanent service to assume responsibility for operation, maintenance, and protection of each permanent service during its use as a construction facility before Owner's acceptance, regardless of previously assigned responsibilities.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Chain-Link Fencing: Minimum 2-inch (50-mm), 0.148-inch- (3.8-mm-) thick, galvanized-steel, chain-link fabric fencing; minimum 6 feet (1.8 m) high with galvanized-steel pipe posts; minimum 2-3/8-inch- (60-mm-) OD line posts and 2-7/8-inch- (73-mm-) OD corner and pull posts, with 1-5/8-inch- (42-mm-) OD top rails.

B. Polyethylene Sheet: Reinforced, fire-resistive sheet, 10-mil (0.25-mm) minimum thickness, with flame-spread rating of 15 or less per ASTM E 84 and passing NFPA 701 Test Method 2.

C. Dust-Control Adhesive-Surface Walk-off Mats: Provide mats minimum 36 by 60 inches (914 by 1624 mm).

D. Insulation: Unfaced mineral-fiber blanket, manufactured from glass, slag wool, or rock wool; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively.

E. Scaffold Enclosure and Safety Netting: Heavy duty horizontal and vertical debris netting shall be placed on scaffolds as required to provide public safety, and inhibit debris from falling onto adjacent sites. If painting or sealers are being applied, contractor shall also provide the necessary netting to protect against over spray.

2.2 TEMPORARY FACILITIES

A. Field Offices, General: Prefabricated or mobile units with serviceable finishes, temperature controls, and foundations adequate for normal loading.

B. Common-Use Field Office: Of sufficient size to accommodate needs of Owner, Architect, Construction Manager, and construction personnel office activities and to accommodate Project meetings specified in other Division 01 Sections. Keep office clean and orderly. Furnish and equip offices as follows:

1. Furniture required for Project-site documents including file cabinets, plan tables, plan racks, and bookcases.

2. Conference room of sufficient size to accommodate meetings of **10** individuals. Provide electrical power service and 120-V ac duplex receptacles, with no fewer than one receptacle on each wall. Furnish room with conference table, chairs, and 4-foot- (1.2-m-) square tack and marker boards.
3. Drinking water and private toilet.
4. Coffee machine and supplies.
5. Heating and cooling equipment necessary to maintain a uniform indoor temperature of 68 to 72 deg F (20 to 22 deg C).
6. Lighting fixtures capable of maintaining average illumination of 20 fc (215 lx) at desk height.

C. Storage and Fabrication Sheds: Provide sheds sized, furnished, and equipped to accommodate materials and equipment for construction operations.

1. Store combustible materials apart from building.

2.3 EQUIPMENT

A. Fire Extinguishers: Portable, UL rated; with class and extinguishing agent as required by locations and classes of fire exposures.

B. HVAC Equipment: Unless Owner authorizes use of permanent HVAC system, provide vented, self-contained, liquid-propane-gas or fuel-oil heaters with individual space thermostatic control.

1. Use of gasoline-burning space heaters, open-flame heaters, or salamander-type heating units is prohibited.
2. Heating Units: Listed and labeled for type of fuel being consumed, by a qualified testing agency acceptable to authorities having jurisdiction, and marked for intended location and application.
3. Permanent HVAC System: If Owner authorizes use of permanent HVAC system for temporary use during construction, provide filter with MERV of **8** at each return-air grille in system and remove at end of construction and clean HVAC system as required in Division 01 Section "Closeout Procedures."
4. Provide all necessary filters as required to meet stated HVAC requisites.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Locate facilities where they will serve Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required by progress of the Work.

1. Locate facilities to limit site disturbance as specified in Division 01 Section "Summary."

B. Provide each facility ready for use when needed to avoid delay. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

3.2 TEMPORARY UTILITY INSTALLATION

A. General: Install temporary service or connect to existing service.

1. Arrange with utility company, Owner, and existing users for time when service can be interrupted, if necessary, to make connections for temporary services.

B. Sewers and Drainage: Provide temporary utilities to remove effluent lawfully.

1. Connect temporary sewers to municipal system as directed by authorities having jurisdiction.

C. Water Service: Install water service and distribution piping in sizes and pressures adequate for construction.

D. Sanitary Facilities: Provide temporary toilets, wash facilities, and drinking water for use of construction personnel. Comply with requirements of authorities having jurisdiction for type, number, location, operation, and maintenance of fixtures and facilities.

1. Toilets: Use of Owner's existing toilet facilities will be permitted, as long as facilities are cleaned and maintained in a condition acceptable to Owner. At Substantial Completion, restore these facilities to condition existing before initial use.

E. Heating and Cooling: Provide temporary heating and cooling required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of low temperatures or high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed.

F. Isolation of Work Areas in Occupied Facilities: Prevent dust, fumes, and odors from entering occupied areas.

1. Prior to commencing work, isolate the HVAC system in area where work is to be performed according to coordination drawings.

a. Disconnect supply and return ductwork in work area from HVAC systems servicing occupied areas.

2. Maintain dust partitions during the Work. Use vacuum collection attachments on dust-producing equipment. Isolate limited work within occupied areas using portable dust-containment devices.
3. Perform daily construction cleanup and final cleanup using approved, HEPA-filter-equipped vacuum equipment.

G. Ventilation and Humidity Control: Provide temporary ventilation required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed. Coordinate ventilation requirements to produce ambient condition required and minimize energy consumption.

1. Provide dehumidification systems when required to reduce substrate moisture levels to level required to allow installation or application of finishes.

H. Electric Power Service: Provide electric power service and distribution system of sufficient size, capacity, and power characteristics required for construction operations.

1. Install electric power service overhead unless otherwise indicated.

I. Lighting: Provide temporary lighting with local switching that provides adequate illumination for construction operations, observations, inspections, and traffic conditions.

1. Install and operate temporary lighting that fulfills security and protection requirements without operating entire system.
2. Install lighting for Project identification sign.

J. Telephone Service: Provide temporary telephone service in common-use facilities. Install **one** telephone line(s) for each field office.

1. Provide additional telephone lines for the following:

a. Provide a dedicated telephone line for each facsimile machine in each field office.

b. Provide **one** telephone line(s) for Owner's use.

2. At each telephone, post a list of important telephone numbers.

a. Police and fire departments.
b. Ambulance service.
c. Contractor's home office.
d. Contractor's emergency after-hours telephone number.
e. Architect's office.
f. Engineers' offices.
g. Owner's office.
h. Principal subcontractors' field and home offices.

3. Provide superintendent with cellular telephone or portable two-way radio for use when away from field office.

3.3 SUPPORT FACILITIES INSTALLATION

A. General: Comply with the following:

1. Provide construction for temporary offices, shops, and sheds located within construction area or within 30 feet (9 m) of building lines that is noncombustible according to ASTM E 136. Comply with NFPA 241.
2. Maintain support facilities until Architect schedules Substantial Completion inspection. Remove before Substantial Completion. Personnel remaining after Substantial

3. Completion will be permitted to use permanent facilities, under conditions acceptable to Owner.

B. Temporary Roads and Paved Areas: Construct and maintain temporary roads and paved areas adequate for construction operations. Locate temporary roads and paved areas within construction limits indicated on Drawings.

1. Provide dust-control treatment that is nonpolluting and nontracking. Reapply treatment as required to minimize dust.

C. Temporary Use of Permanent Roads and Paved Areas: Locate temporary roads and paved areas in same location as permanent roads and paved areas. Construct and maintain temporary roads and paved areas adequate for construction operations. Extend temporary roads and paved areas, within construction limits indicated, as necessary for construction operations.

1. Coordinate elevations of temporary roads and paved areas with permanent roads and paved areas.
2. Prepare subgrade and install subbase and base for temporary roads and paved areas according to Division 31 Section "Earth Moving."
3. Recondition base after temporary use, including removing contaminated material, regrading, proofrolling, compacting, and testing.
4. Delay installation of final course of permanent hot-mix asphalt pavement until immediately before Substantial Completion. Repair hot-mix asphalt base-course pavement before installation of final course according to Division 32 Section "Asphalt Paving."

D. Traffic Controls: Comply with requirements of authorities having jurisdiction.

1. Protect existing site improvements to remain including curbs, pavement, and utilities.
2. Maintain access for fire-fighting equipment and access to fire hydrants.

E. Parking: Provide temporary parking areas for construction personnel.

F. Dewatering Facilities and Drains: Comply with requirements of authorities having jurisdiction. Maintain Project site, excavations, and construction free of water.

1. Dispose of rainwater in a lawful manner that will not result in flooding Project or adjoining properties or endanger permanent Work or temporary facilities.
2. Remove snow and ice as required to minimize accumulations.

G. Project Signs: Provide Project signs as required by developer. Unauthorized signs are not permitted.

1. Identification Signs: Provide Project identification signs as indicated on Drawings.
2. Temporary Signs: Provide other signs as indicated and as required to inform public and individuals seeking entrance to Project.

   a. Provide temporary, directional signs for construction personnel and visitors.

3. Maintain and touchup signs so they are legible at all times.

H. Waste Disposal Facilities: Comply with requirements specified in Division 01 Section "Construction Waste Management and Disposal."

I. Waste Disposal Facilities: Provide waste-collection containers in sizes adequate to handle waste from construction operations. Comply with requirements of authorities having jurisdiction. Comply with progress cleaning requirements in Division 01 Section "Execution."

J. Lifts and Hoists: Provide facilities necessary for hoisting materials and personnel.

1. Truck cranes and similar devices used for hoisting materials are considered "tools and equipment" and not temporary facilities.

3.4 SECURITY AND PROTECTION FACILITIES INSTALLATION

A. Protection of Existing Facilities: Protect existing vegetation, equipment, structures, utilities, and other improvements at Project site and on adjacent properties, except those indicated to be removed or altered. Repair damage to existing facilities.

B. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction as required to comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects.

1. Comply with work restrictions specified in Division 01 Section "Summary."

C. Temporary Erosion and Sedimentation Control: Comply with requirements of 2003 EPA Construction General Permit or authorities having jurisdiction, whichever is more stringent and requirements specified in Division 31 Section "Site Clearing."

D. Temporary Erosion and Sedimentation Control: Provide measures to prevent soil erosion and discharge of soil-bearing water runoff and airborne dust to undisturbed areas and to adjacent properties and walkways, according to erosion and sedimentation-control Drawings requirements of 2003 EPA Construction General Permit or authorities having jurisdiction, whichever is more stringent.

1. Verify that flows of water redirected from construction areas or generated by construction activity do not enter or cross tree- or plant- protection zones.
2. Inspect, repair, and maintain erosion- and sedimentation-control measures during construction until permanent vegetation has been established.
3. Clean, repair, and restore adjoining properties and roads affected by erosion and sedimentation from Project site during the course of Project.
4. Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

E. Stormwater Control: Comply with requirements of authorities having jurisdiction. Provide barriers in and around excavations and subgrade construction to prevent flooding by runoff of stormwater from heavy rains.

F. Tree and Plant Protection: Comply with requirements specified in Division 01 Section "Temporary Tree and Plant Protection."

G. Tree and Plant Protection: Install temporary fencing located as indicated or outside the drip line of trees to protect vegetation from damage from construction operations. Protect tree root systems from damage, flooding, and erosion.

H. Pest Control: Engage pest-control service to recommend practices to minimize attraction and harboring of rodents, roaches, and other pests and to perform extermination and control procedures at regular intervals so Project will be free of pests and their residues at Substantial Completion. Perform control operations lawfully, using environmentally safe materials.

I. Site Enclosure Fence: Before construction operations begin, furnish and install site enclosure fence in a manner that will prevent people and animals from easily entering site except by entrance gates.

1. Extent of Fence: As required to enclose entire Project site or portion determined sufficient to accommodate construction operations.
2. Maintain security by limiting number of keys and restricting distribution to authorized personnel. Furnish one set of keys to Owner.

J. Security Enclosure and Lockup: Install temporary enclosure around partially completed areas of construction. Provide lockable entrances to prevent unauthorized entrance, vandalism, theft, and similar violations of security. Lock entrances at end of each work day.

K. Barricades, Warning Signs, and Lights: Comply with requirements of authorities having jurisdiction for erecting structurally adequate barricades, including warning signs and lighting.

L. Temporary Egress: Maintain temporary egress from existing occupied facilities as indicated and as required by authorities having jurisdiction.

M. Covered Walkway: Erect protective, covered walkway for passage of individuals through or adjacent to Project site. Coordinate with entrance gates, other facilities, and obstructions. Comply with regulations of authorities having jurisdiction.

1. Construct covered walkways using scaffold or shoring framing.
2. Provide overhead decking, protective enclosure walls, handrails, barricades, warning signs, exit signs, lights, safe and well-drained walkways, and similar provisions for protection and safe passage.
3. Paint and maintain appearance of walkway for duration of the Work.

N. Temporary Enclosures: Provide temporary enclosures for protection of construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities. Provide temporary weathertight enclosure for building exterior.

1. Where heating or cooling is needed and permanent enclosure is incomplete, insulate temporary enclosures.

O. Temporary Fire Protection: Install and maintain temporary fire-protection facilities of types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 241; manage fire-prevention program.

1. Prohibit smoking in construction areas.
2. Supervise welding operations, combustion-type temporary heating units, and similar sources of fire ignition according to requirements of authorities having jurisdiction.
3. Develop and supervise an overall fire-prevention and -protection program for personnel at Project site. Review needs with local fire department and establish procedures to be followed. Instruct personnel in methods and procedures. Post warnings and information.
4. Provide temporary standpipes and hoses for fire protection. Hang hoses with a warning sign stating that hoses are for fire-protection purposes only and are not to be removed. Match hose size with outlet size and equip with suitable nozzles.

3.5 MOISTURE AND MOLD CONTROL

A. Contractor's Moisture-Protection Plan: Avoid trapping water in finished work. Document visible signs of mold that may appear during construction.

B. Exposed Construction Phase: Before installation of weather barriers, when materials are subject to wetting and exposure and to airborne mold spores, protect as follows:

1. Protect porous materials from water damage.
2. Protect stored and installed material from flowing or standing water.
3. Keep porous and organic materials from coming into prolonged contact with concrete.
4. Remove standing water from decks.
5. Keep deck openings covered or dammed.

C. Partially Enclosed Construction Phase: After installation of weather barriers but before full enclosure and conditioning of building, when installed materials are still subject to infiltration of moisture and ambient mold spores, protect as follows:

1. Do not load or install drywall or other porous materials or components, or items with high organic content, into partially enclosed building.
2. Keep interior spaces reasonably clean and protected from water damage.
3. Periodically collect and remove waste containing cellulose or other organic matter.
4. Discard or replace water-damaged material.
5. Do not install material that is wet.
6. Discard, replace, or clean stored or installed material that begins to grow mold.
7. Perform work in a sequence that allows any wet materials adequate time to dry before enclosing the material in drywall or other interior finishes.

D. Controlled Construction Phase of Construction: After completing and sealing of the building enclosure but prior to the full operation of permanent HVAC systems, maintain as follows:

1. Control moisture and humidity inside building by maintaining effective dry-in conditions.
2. Use permanent HVAC system to control humidity.
3. Comply with manufacturer's written instructions for temperature, relative humidity, and exposure to water limits.

   a. Hygroscopic materials that may support mold growth, including wood and gypsum-based products, that become wet during the course of construction and remain wet for **48** hours are considered defective.
   b. Measure moisture content of materials that have been exposed to moisture during construction operations or after installation. Record readings beginning at time of exposure and continuing daily for **48** hours. Identify materials containing moisture levels higher than allowed. Report findings in writing to Architect.
   c. Remove materials that can not be completely restored to their manufactured moisture level within **48** hours.

3.6 OPERATION, TERMINATION, AND REMOVAL

A. Supervision: Enforce strict discipline in use of temporary facilities. To minimize waste and abuse, limit availability of temporary facilities to essential and intended uses.

B. Maintenance: Maintain facilities in good operating condition until removal.

1. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation, and similar facilities on a 24-hour basis where required to achieve indicated results and to avoid possibility of damage.

C. Operate Project-identification-sign lighting daily from dusk until 12:00 midnight.

D. Temporary Facility Changeover: Do not change over from using temporary security and protection facilities to permanent facilities until Substantial Completion.

E. Termination and Removal: Remove each temporary facility when need for its service has ended, when it has been replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.

1. Materials and facilities that constitute temporary facilities are property of Contractor. Owner reserves right to take possession of Project identification signs.
2. Remove temporary roads and paved areas not intended for or acceptable for integration into permanent construction. Where area is intended for landscape development, remove soil and aggregate fill that do not comply with requirements for fill or subsoil. Remove materials contaminated with road oil, asphalt and other petrochemical compounds, and other substances that might impair growth of plant materials or lawns. Repair or replace
3.

4. street paving, curbs, and sidewalks at temporary entrances, as required by authorities having jurisdiction.
5. At Substantial Completion, repair, renovate, and clean permanent facilities used during construction period. Comply with final cleaning requirements specified in Division 01 Section "Closeout Procedures."

END OF SECTION 015000

SECTION 01 57 13 – TEMPORARY EROSION AND SEDIMENT CONTROL

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Prevention of erosion due to construction activities.

B. Prevention of sedimentation of waterways, open drainage ways, and storm and sanitary sewers due to construction activities.

C. Restoration of areas eroded due to insufficient preventive measures.

D. Compensation of Owner for fines levied by authorities having jurisdiction due to non-compliance by Contractor.

1.2 RELATED REQUIREMENTS (Reference Civil Drawings for the following Sections)

A. Section 31 10 00 – Site Clearing: Limits on clearing, disposition of vegetative clearing debris.

B. Section 31 20 00 – Earth Moving: Temporary and permanent grade changes for erosion control.

C. Section 32 90 00 – Planting: Permanent plantings for erosion control.

D. Section 32 92 19 – Seeding: Permanent turf for erosion control.

E. Section 32 92 23 – Sodding: Permanent turf for erosion control.

1.3 REFERENCE STANDARDS

A. EPA (NPDES) – National Pollutant Discharge Elimination System (NPDES), Construction General Permit; current edition.

1.4 PERFORMANCE REQUIREMENTS

A. Comply with all requirements of U.S. Environmental Protection Agency for erosion and sedimentation control, as specified for the National Pollutant Discharge Elimination (NPDES), Phases 1 and II, under requirements for the 2003 Construction General Permit (CGP), whether the project is required by law to comply or not.

B. Also comply with all more stringent requirements of State of Texas Erosion and Sedimentation Control Manual.

C. Comply with all requirements of City of League City, Texas erosion and sedimentation control.

D. Develop and follow an Erosion and Sedimentation Prevention Plan and submit periodic inspection reports.

E. Do not begin clearing, grading, or other work involving disturbance of ground surface cover until applicable permits have been obtained; furnish all documentation required to obtain applicable permits.

F. Timing: Put preventive measures in place as soon as possible after disturbance of surface cover and before precipitation occurs.

G. Storm Water Runoff: Control increased storm water runoff due to disturbance of surface cover due to construction activities for this project.
   1. Prevent runoff into storm and sanitary sewer systems, including open drainage channels, in excess of actual capacity or amount allowed by authorities having jurisdiction, whichever is less.

H. Maintenance: Maintain temporary preventative measures until permanent measures have been established.

1.5 SUBMITTALS

A. See Section 01 33 00 – Submittal Procedures, for submittal procedures.

B. Inspection Reports: Submit report of each inspection; identify each preventive measure, indicate condition, and specify maintenance or repair required and accomplished.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Materials indicated on Drawings.

PART 3 – EXECUTION

3.1 EXAMINATION

A. Examine site and identify existing features that contribute to erosion resistance; maintain such existing features to greatest extent possible.

3.2 PREPARATION

A. Schedule work so that soil surfaces are left exposed for the minimum amount of time.

3.3 SCOPE OF PREVENTIVE MEASURES

A. In all cases, if permanent erosion resistant measures have been installed temporary preventive measures are not required.

3.4 MAINTENANCE

A. Inspect preventive measures weekly, within 24 hours after the end of any storm that produces 0.5 inches or more rainfall at the project site, and daily during prolonged rainfall.

B. Repair deficiencies immediately.

C. Clean out temporary sediment control structures weekly and relocate soil on site.

D. Place sediment in appropriate locations on site; do not remove from site.

3.5 CLEAN UP

A. Remove temporary measures after permanent measures have been installed, unless permitted to remain by Architect.

B. Clean out temporary sediment control structures that are to remain as permanent measures.

C. Where removal of temporary measures would leave exposed soil, shape surface to an acceptable grade and finish to match adjacent ground surfaces.

END OF SECTION

SECTION 016000 - PRODUCT REQUIREMENTS

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.

1.2 SUMMARY

A. Section includes administrative and procedural requirements for selection of products for use in Project; product delivery, storage, and handling; manufacturers' standard warranties on products; special warranties; and comparable products.

B. Related Requirements:

1. Division 01 Section "Allowances" for products selected under an allowance.
2. Division 01 Section "Substitution Procedures" for requests for substitutions.
3. Division 01 Section "References" for applicable industry standards for products specified.

1.3 DEFINITIONS

A. Products: Items obtained for incorporating into the Work, whether purchased for Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.

1. Named Products: Items identified by manufacturer's product name, including make or model number or other designation shown or listed in manufacturer's published product literature that is current as of date of the Contract Documents.
2. New Products: Items that have not previously been incorporated into another project or facility. Products salvaged or recycled from other projects are not considered new products.
3. Comparable Product: Product that is demonstrated and approved through submittal process to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.

B. Basis-of-Design Product Specification: A specification in which a specific manufacturer's product is named and accompanied by the words "basis-of-design product," including make or model number or other designation, to establish the significant qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics for purposes of evaluating comparable products of additional manufacturers named in the specification.

1.4 ACTION SUBMITTALS

A. Comparable Product Requests: Submit request for consideration of each comparable product. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.

1. Include data to indicate compliance with the requirements specified in "Comparable Products" Article.
2. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within one week of receipt of a comparable product request. Architect will notify Contractor of approval or rejection of proposed comparable product request within 15 days of receipt of request, or seven days of receipt of additional information or documentation, whichever is later.

   a. Form of Approval: As specified in Division 01 Section "Submittal Procedures."
   b. Use product specified if Architect does not issue a decision on use of a comparable product request within time allocated.

B. Basis-of-Design Product Specification Submittal: Comply with requirements in Division 01 Section "Submittal Procedures." Show compliance with requirements.

1.5 QUALITY ASSURANCE

A. Compatibility of Options: If Contractor is given option of selecting between two or more products for use on Project, select product compatible with products previously selected, even if previously selected products were also options.

1. Each contractor is responsible for providing products and construction methods compatible with products and construction methods of other contractors.
2. If a dispute arises between contractors over concurrently selectable but incompatible products, Architect will determine which products shall be used.

1.6 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, and handle products using means and methods that will prevent damage, deterioration, and loss, including theft and vandalism. Comply with manufacturer's written instructions.

B. Delivery and Handling:

1. Schedule delivery to minimize long-term storage at Project site and to prevent overcrowding of construction spaces.
2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.

3. Deliver products to Project site in an undamaged condition in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
4. Inspect products on delivery to determine compliance with the Contract Documents and to determine that products are undamaged and properly protected.

C. Storage:

1. Store products to allow for inspection and measurement of quantity or counting of units.
2. Store materials in a manner that will not endanger Project structure.
3. Store products that are subject to damage by the elements, under cover in a weathertight enclosure above ground, with ventilation adequate to prevent condensation.
4. Protect foam plastic from exposure to sunlight, except to extent necessary for period of installation and concealment.
5. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.
6. Protect stored products from damage and liquids from freezing.
7. Provide a secure location and enclosure at Project site for storage of materials and equipment by Owner's construction forces. Coordinate location with Owner.

1.7 PRODUCT WARRANTIES

A. Warranties specified in other Sections shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.

1. Manufacturer's Warranty: Written warranty furnished by individual manufacturer for a particular product and specifically endorsed by manufacturer to Owner.
2. Special Warranty: Written warranty required by the Contract Documents to provide specific rights for Owner.

B. Special Warranties: Prepare a written document that contains appropriate terms and identification, ready for execution.

1. Manufacturer's Standard Form: Modified to include Project-specific information and properly executed.
2. Specified Form: When specified forms are included with the Specifications, prepare a written document using indicated form properly executed.
3. See Divisions 02 through 33 Sections for specific content requirements and particular requirements for submitting special warranties.

C. Submittal Time: Comply with requirements in Division 01 Section "Closeout Procedures."

PART 2 - PRODUCTS

2.1 PRODUCT SELECTION PROCEDURES

A. General Product Requirements: Provide products that comply with the Contract Documents, are undamaged and, unless otherwise indicated, are new at time of installation.

1. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.
2. Standard Products: If available, and unless custom products or nonstandard options are specified, provide standard products of types that have been produced and used successfully in similar situations on other projects.
3. Owner reserves the right to limit selection to products with warranties not in conflict with requirements of the Contract Documents.
4. Where products are accompanied by the term "as selected," Architect will make selection.
5. Descriptive, performance, and reference standard requirements in the Specifications establish salient characteristics of products.
6. Or Equal: For products specified by name and accompanied by the term "or equal," or "or approved equal," or "or approved," comply with requirements in "Comparable Products" Article to obtain approval for use of an unnamed product.

B. Product Selection Procedures:

1. Product: Where Specifications name a single manufacturer and product, provide the named product that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered (unless approved by Owner prior to submitting to Architect).
2. Manufacturer/Source: Where Specifications name a single manufacturer or source, provide a product by the named manufacturer or source that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered (unless approved by Owner prior to submitting to Architect).
3. Products:

a. Restricted List: Where Specifications include a list of names of both manufacturers and products, provide one of the products listed that complies with requirements. Comparable products or substitutions for Contractor's convenience will be considered unless otherwise indicated. Obtain architect’s written approval for alternate material prior to submitting.
b. Non-restricted List: Where Specifications include a list of names of both available manufacturers and products, provide one of the products listed, or an unnamed product, that complies with requirements. Comply with requirements in "Comparable Products" Article for consideration of an unnamed product.

4. Manufacturers:

   a. Restricted List: Where Specifications include a list of manufacturers' names, provide a product by one of the manufacturers listed that complies with requirements. Comparable products or substitutions for Contractor's convenience will be considered unless otherwise indicated. Obtain architect's written approval for alternate material prior to submitting.
   b. Non-restricted List: Where Specifications include a list of available manufacturers, provide a product by one of the manufacturers listed, or a product by an unnamed manufacturer, that complies with requirements. Comply with requirements in "Comparable Products" Article for consideration of an unnamed manufacturer's product.

5. Basis-of-Design Product: Where Specifications name a product, or refer to a product indicated on Drawings, and include a list of manufacturers, provide the specified or indicated product or a comparable product by one of the other named manufacturers. Drawings and Specifications indicate sizes, profiles, dimensions, and other characteristics that are based on the product named. Comply with requirements in "Comparable Products" Article for consideration of an unnamed product by one of the other named manufacturers.

C. Visual Matching Specification: Where Specifications require "match Architect's sample", provide a product that complies with requirements and matches Architect's sample. Architect's decision will be final on whether a proposed product matches.

1. If no product available within specified category matches and complies with other specified requirements, comply with requirements in Division 01 Section "Substitution Procedures" for proposal of product.

D. Visual Selection Specification: Where Specifications include the phrase "as selected by Architect from manufacturer's full range" or similar phrase, select a product that complies with requirements. Architect will select color, gloss, pattern, density, or texture from manufacturer's product line that includes both standard and premium items.

2.2 COMPARABLE PRODUCTS

A. Conditions for Consideration: Architect will consider Contractor's request for comparable product when the following conditions are satisfied. If the following conditions are not satisfied, Architect may return requests without action, except to record noncompliance with these requirements:

1. Evidence that the proposed product does not require revisions to the Contract Documents that it is consistent with the Contract Documents and will produce the indicated results, and that it is compatible with other portions of the Work.
2. Detailed comparison of significant qualities of proposed product with those named in the Specifications. Significant qualities include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.
3. Evidence that proposed product provides specified warranty.

4. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners, if requested.
5. Samples, if requested.
6. Reference Section 01 25 16 Substitution Request Form.

PART 3 - EXECUTION (Not Used)

END OF SECTION 016000

SECTION 017300 - EXECUTION

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.

1.2 SUMMARY

A. Section includes general administrative and procedural requirements governing execution of the Work including, but not limited to, the following:

1. Construction layout.
2. Field engineering and surveying.
3. Installation of the Work.
4. Cutting and patching.
5. Coordination of Owner-installed products.
6. Progress cleaning.
7. Starting and adjusting.
8. Protection of installed construction.
9. Correction of the Work.

B. Related Requirements:

1. Division 01 Section "Summary" for limits on use of Project site.
2. Division 01 Section "Submittal Procedures" for submitting surveys.
3. Division 01 Section "Closeout Procedures" for submitting final property survey with Project Record Documents, recording of Owner-accepted deviations from indicated lines and levels, and final cleaning.
4. Division 02 Section "Selective Structure Demolition" for demolition and removal of selected portions of the building.
5. Division 07 Section "Penetration Firestopping" for patching penetrations in fire-rated construction.

1.3 DEFINITIONS

A. Cutting: Removal of in-place construction necessary to permit installation or performance of other work.

B. Patching: Fitting and repair work required to restore construction to original conditions after installation of other work.

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For professional engineer.

B. Certificates: Submit certificate signed by professional engineer certifying that location and elevation of improvements comply with requirements.

C. Cutting and Patching Plan: Submit plan describing procedures at least 10 days prior to the time cutting and patching will be performed. Include the following information:

1. Extent: Describe reason for and extent of each occurrence of cutting and patching.
2. Changes to In-Place Construction: Describe anticipated results. Include changes to structural elements and operating components as well as changes in building appearance and other significant visual elements.
3. Products: List products to be used for patching and firms or entities that will perform patching work.
4. Dates: Indicate when cutting and patching will be performed.
5. Utilities and Mechanical and Electrical Systems: List services and systems that cutting and patching procedures will disturb or affect. List services and systems that will be relocated and those that will be temporarily out of service. Indicate length of time permanent services and systems will be disrupted.

    a. Include description of provisions for temporary services and systems during interruption of permanent services and systems.

D. Landfill Receipts: Submit copy of receipts issued by a landfill facility, licensed to accept hazardous materials, for hazardous waste disposal.

E. Certified Surveys: Submit two copies signed by professional engineer. Property survey is to be provided by Owner and incorporated into the Construction Documents.

F. Final Property Survey: Submit 10 copies showing the Work performed and record survey data.

1.5 QUALITY ASSURANCE

A. Land Surveyor Qualifications: A professional land surveyor who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing land-surveying services of the kind indicated.

B. Cutting and Patching: Comply with requirements for and limitations on cutting and patching of construction elements.

1. Structural Elements: When cutting and patching structural elements, notify Architect of locations and details of cutting and await directions from Architect before proceeding. Shore, brace, and support structural elements during cutting and patching. Do not cut and patch structural elements in a manner that could change their load-carrying capacity or increase deflection

2. Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that result in increased maintenance or decreased operational life or safety. Operational elements include the following:

    a. Primary operational systems and equipment.
    b. Fire separation assemblies.
    c. Air or smoke barriers.
    d. Fire-suppression systems.
    e. Mechanical systems piping and ducts.
    f. Control systems.
    g. Communication systems.
    h. Fire-detection and -alarm systems.
    i. Conveying systems.
    j. Electrical wiring systems.
    k. Operating systems of special construction.

3. Other Construction Elements: Do not cut and patch other construction elements or components in a manner that could change their load-carrying capacity that results in reducing their capacity to perform as intended, or that result in increased maintenance or decreased operational life or safety. Other construction elements include but are not limited to the following:

    a. Water, moisture, or vapor barriers.
    b. Membranes and flashings.
    c. Exterior curtain-wall construction.
    d. Sprayed fire-resistive material.
    e. Equipment supports.
    f. Piping, ductwork, vessels, and equipment.
    g. Noise- and vibration-control elements and systems.

4. Visual Elements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch exposed construction in a manner that would, in Architect's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.

C. Cutting and Patching Conference: Before proceeding, meet at Project site with parties involved in cutting and patching, including mechanical and electrical trades. Review areas of potential interference and conflict. Coordinate procedures and resolve potential conflicts before proceeding.

D. Manufacturer's Installation Instructions: Obtain and maintain on-site manufacturer's written recommendations and instructions for installation of products and equipment.

PART 2 - PRODUCTS

2.1 MATERIALS

A. General: Comply with requirements specified in other Sections.

1. For projects requiring compliance with sustainable design and construction practices and procedures, use products for patching that comply with requirements in Division 01 sustainable design requirements Section.

B. In-Place Materials: Use materials for patching identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.

1. If identical materials are unavailable or cannot be used, use materials that, when installed, will provide a match acceptable to Architect for the visual and functional performance of in-place materials.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Existing Conditions: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning sitework, investigate and verify the existence and location of underground utilities, mechanical and electrical systems, and other construction affecting the Work.

1. Before construction, verify the location and invert elevation at points of connection of sanitary sewer, storm sewer, and water-service piping; underground electrical services, and other utilities.
2. Furnish location data for work related to Project that must be performed by public utilities serving Project site.

B. Examination and Acceptance of Conditions: Before proceeding with each component of the Work, examine substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.

1. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.
2. Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.
3. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.

C. Written Report: Where a written report listing conditions detrimental to performance of the Work is required by other Sections, include the following:

1. Description of the Work.
2. List of detrimental conditions, including substrates.
3. List of unacceptable installation tolerances.
4. Recommended corrections.

D. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

3.2 PREPARATION

A. Existing Utility Information: Furnish information to local utility and Owner that is necessary to adjust, move, or relocate existing utility structures, utility poles, lines, services, or other utility appurtenances located in or affected by construction. Coordinate with authorities having jurisdiction.

B. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

C. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.

D. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents caused by differing field conditions outside the control of Contractor, submit a request for information to Architect according to requirements in Division 01 Section "Project Management and Coordination."

3.3 CONSTRUCTION LAYOUT

A. Verification: Before proceeding to lay out the Work, verify layout information shown on Drawings, in relation to the property survey and existing benchmarks. If discrepancies are discovered, notify Architect and Construction Manager promptly.

B. General: Engage a professional engineer to lay out the Work using accepted surveying practices.

1. Establish benchmarks and control points to set lines and levels at each story of construction and elsewhere as needed to locate each element of Project.
2. Establish limits on use of Project site.
3. Establish dimensions within tolerances indicated. Do not scale Drawings to obtain required dimensions.
4. Inform installers of lines and levels to which they must comply.

5. Check the location, level and plumb, of every major element as the Work progresses.
6. Notify Architect and Construction Manager when deviations from required lines and levels exceed allowable tolerances.
7. Close site surveys with an error of closure equal to or less than the standard established by authorities having jurisdiction.

C. Site Improvements: Locate and lay out site improvements, including pavements, grading, fill and topsoil placement, utility slopes, and rim and invert elevations.

D. Building Lines and Levels: Locate and lay out control lines and levels for structures, building foundations, column grids, and floor levels, including those required for mechanical and electrical work. Transfer survey markings and elevations for use with control lines and levels. Level foundations and piers from two or more locations.

E. Record Log: Maintain a log of layout control work. Record deviations from required lines and levels. Include beginning and ending dates and times of surveys, weather conditions, name and duty of each survey party member, and types of instruments and tapes used. Make the log available for reference by Architect and Construction Manager.

3.4 FIELD ENGINEERING

A. Identification: Owner will identify existing benchmarks, control points, and property corners.

B. Reference Points: Locate existing permanent benchmarks, control points, and similar reference points before beginning the Work. Preserve and protect permanent benchmarks and control points during construction operations.

1. Do not change or relocate existing benchmarks or control points without prior written approval of Architect or Construction Manager. Report lost or destroyed permanent benchmarks or control points promptly. Report the need to relocate permanent benchmarks or control points to Architect and Construction Manager before proceeding.
2. Replace lost or destroyed permanent benchmarks and control points promptly. Base replacements on the original survey control points.

C. Benchmarks: Establish and maintain a minimum of two permanent benchmarks on Project site, referenced to data established by survey control points. Comply with authorities having jurisdiction for type and size of benchmark.

1. Record benchmark locations, with horizontal and vertical data, on Project Record Documents.
2. Where the actual location or elevation of layout points cannot be marked, provide temporary reference points sufficient to locate the Work.
3. Remove temporary reference points when no longer needed. Restore marked construction to its original condition.

D. Certified Survey: On completion of foundation walls, major site improvements, and other work requiring field-engineering services, prepare a certified survey showing dimensions, locations, angles, and elevations of construction and sitework.

E. Final Property Survey: Engage a professional engineer to prepare a final property survey showing significant features (real property) for Project. Include on the survey a certification, signed by professional engineer, that principal metes, bounds, lines, and levels of Project are accurately positioned as shown on the survey.

1. Show boundary lines, monuments, streets, grade contours, and the distance and bearing from a site corner to a legal point.

3.5 INSTALLATION

A. General: Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.

1. Make vertical work plumb and make horizontal work level.
2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
3. Conceal pipes, ducts, and wiring in finished areas unless otherwise indicated.
4. Maintain minimum headroom clearance of 96 inches (2440 mm) in occupied spaces and 90 inches (2300 mm) in unoccupied spaces.

B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.

C. Install products at the time and under conditions that will ensure the best possible results. Maintain conditions required for product performance until Substantial Completion.

D. Conduct construction operations so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy.

E. Sequence the Work and allow adequate clearances to accommodate movement of construction items on site and placement in permanent locations.

F. Tools and Equipment: Do not use tools or equipment that produces harmful noise levels.

G. Templates: Obtain and distribute to the parties involved templates for work specified to be factory prepared and field installed. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.

H. Attachment: Provide blocking and attachment plates and anchors and fasteners of adequate size and number to securely anchor each component in place, accurately located and aligned with other portions of the Work. Where size and type of attachments are not indicated, verify size and type required for load conditions.

1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Architect.
2. Allow for building movement, including thermal expansion and contraction.

3. Coordinate installation of anchorages. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

I. Joints: Make joints of uniform width. Where joint locations in exposed work are not indicated, arrange joints for the best visual effect. Fit exposed connections together to form hairline joints.

J. Hazardous Materials: Use products, cleaners, and installation materials that are not considered hazardous.

3.6 CUTTING AND PATCHING

A. Cutting and Patching, General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.

1. Cut in-place construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.

B. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during installation or cutting and patching operations, by methods and with materials so as not to void existing warranties.

C. Temporary Support: Provide temporary support of work to be cut.

D. Protection: Protect in-place construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.

E. Adjacent Occupied Areas: Where interference with use of adjoining areas or interruption of free passage to adjoining areas is unavoidable, coordinate cutting and patching according to requirements in Division 01 Section "Summary."

F. Existing Utility Services and Mechanical/Electrical Systems: Where existing services/systems are required to be removed, relocated, or abandoned, bypass such services/systems before cutting to prevent interruption to occupied areas.

G. Cutting: Cut in-place construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.

1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots neatly to minimum size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
2. Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
3. Concrete and Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.

4. Excavating and Backfilling: Comply with requirements in applicable Division 31 Sections where required by cutting and patching operations.
5. Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.
6. Proceed with patching after construction operations requiring cutting are complete.

H. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other work. Patch with durable seams that are as invisible as practicable. Provide materials and comply with installation requirements specified in other Sections, where applicable.

1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate physical integrity of installation.
2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will minimize evidence of patching and refinishing.

   a. Clean piping, conduit, and similar features before applying paint or other finishing materials.
   b. Restore damaged pipe covering to its original condition.

3. Floors and Walls: Where walls or partitions that are removed extend one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish, color, texture, and appearance. Remove in-place floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.

   a. Where patching occurs in a painted surface, prepare substrate and apply primer and intermediate paint coats appropriate for substrate over the patch, and apply final paint coat over entire unbroken surface containing the patch. Provide additional coats until patch blends with adjacent surfaces.

4. Ceilings: Patch, repair, or rehang in-place ceilings as necessary to provide an even-plane surface of uniform appearance.
5. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weathertight condition and ensures thermal and moisture integrity of building enclosure.

I. Cleaning: Clean areas and spaces where cutting and patching are performed. Remove paint, mortar, oils, putty, and similar materials from adjacent finished surfaces.

3.7 WNER-INSTALLED PRODUCTS

A. Site Access: Provide access to Project site for Owner's construction personnel.

B. Coordination: Coordinate construction and operations of the Work with work performed by Owner's construction personnel.

1. Construction Schedule: Inform Owner of Contractor's preferred construction schedule for Owner's portion of the Work. Adjust construction schedule based on a mutually agreeable timetable. Notify Owner if changes to schedule are required due to differences in actual construction progress.
2. Pre-installation Conferences: Include Owner's construction personnel at pre-installation conferences covering portions of the Work that are to receive Owner's work. Attend pre-installation conferences conducted by Owner's construction personnel if portions of the Work depend on Owner's construction.

3.8 PROGRESS CLEANING

A. General: Clean Project site and work areas daily, including common areas. Enforce requirements strictly. Dispose of materials lawfully.

1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.
2. Do not hold waste materials more than seven days during normal weather or three days if the temperature is expected to rise above 80 deg F (27 deg C).
3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.

   a. Use containers intended for holding waste materials of type to be stored.

4. Coordinate progress cleaning for joint-use areas where Contractor and other contractors are working concurrently.

B. Site: Maintain Project site free of waste materials and debris.

C. Work Areas: Clean areas where work is in progress to the level of cleanliness necessary for proper execution of the Work.

1. Remove liquid spills promptly.
2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.

D. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.

E. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.

F. Exposed Surfaces in Finished Areas: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.

G. Waste Disposal: Do not bury or burn waste materials on-site. Do not wash waste materials down sewers or into waterways. Comply with waste disposal requirements in Division 01 Section "Temporary Facilities and Controls" and "Construction Waste Management and Disposal."

H. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.

I. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.

J. Limiting Exposures: Supervise construction operations to assure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

3.9 STARTING AND ADJUSTING

A. Coordinate startup and adjusting of equipment and operating components with requirements in Division 01 Section "General Commissioning Requirements."

B. Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.

C. Adjust equipment for proper operation. Adjust operating components for proper operation without binding.

D. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

E. Manufacturer's Field Service: Comply with qualification requirements in Division 01 Section "Quality Requirements."

3.10 PROTECTION OF INSTALLED CONSTRUCTION

A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.

B. Comply with manufacturer's written instructions for temperature and relative humidity.

END OF SECTION 017300

SECTION 017700 - CLOSEOUT PROCEDURES

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.

B. Reference Section 011000 Summary & Supplementary Information for additional requirements.

1.2 SUMMARY

A. Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:

1. Substantial Completion procedures.
2. Final completion procedures.
3. Warranties.
4. Final cleaning.
5. Repair of the Work.

B. Related Requirements:

1. Division 01 Section "Photographic Documentation" for submitting final completion construction photographic documentation.
2. Division 01 Section "Execution" for progress cleaning of Project site.
3. Division 01 Section "Operation and Maintenance Data" for operation and maintenance manual requirements.
4. Division 01 Section "Project Record Documents" for submitting record Drawings, record Specifications, and record Product Data.
5. Division 01 Section "Demonstration and Training" for requirements for instructing Owner's personnel.
6. Divisions 02 through 33 Sections for specific closeout and special cleaning requirements for the Work in those Sections.

1.3 ACTION SUBMITTALS

A. Product Data: For cleaning agents.

B. Contractor's List of Incomplete Items: Initial submittal at Substantial Completion.

C. Certified List of Incomplete Items: Final submittal at Final Completion.

1.4 CLOSEOUT SUBMITTALS

A. Certificates of Release: From authorities having jurisdiction.

B. Field Report: For pest control inspection.

1.5 MAINTENANCE MATERIAL SUBMITTALS

A. Schedule of Maintenance Material Items: For maintenance material submittal items specified in other Sections.

1.6 SUBSTANTIAL COMPLETION PROCEDURES

A. Contractor's List of Incomplete Items: Prepare and submit a list of items to be completed and corrected (Contractor's punch list), indicating the value of each item on the list and reasons why the Work is incomplete.

B. Submittals Prior to Substantial Completion: Complete the following a minimum of 10 days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.

1. Certificates of Release: Obtain and submit releases from authorities having jurisdiction permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
2. Submit closeout submittals specified in other Division 01 Sections, including project record documents, operation and maintenance manuals, final completion construction photographic documentation, damage or settlement surveys, property surveys, and similar final record information.
3. Submit closeout submittals specified in individual Divisions 02 through 33 Sections, including specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
4. Submit maintenance material submittals specified in individual Divisions 02 through 33 Sections, including tools, spare parts, extra materials, and similar items, and deliver to location designated by Architect. Label with manufacturer's name and model number where applicable.

    a. Schedule of Maintenance Material Items: Prepare and submit schedule of maintenance material submittal items, including name and quantity of each item and name and number of related Specification Section. Obtain Architect's signature for receipt of submittals.

5. Submit test/adjust/balance records.
6. Submit sustainable design submittals required in Division 01 sustainable design requirements Section and in individual Division 02 through 33 Sections.

7. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.

C. Procedures Prior to Substantial Completion: Complete the following a minimum of 10 days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.

1. Advise Owner of pending insurance changeover requirements.
2. Make final changeover of permanent locks and deliver keys to Owner. Advise Owner's personnel of changeover in security provisions.
3. Complete startup and testing of systems and equipment.
4. Perform preventive maintenance on equipment used prior to Substantial Completion.
5. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems. Submit demonstration and training video recordings specified in Division 01 Section "Demonstration and Training."
6. Advise Owner of changeover in heat and other utilities.
7. Participate with Owner in conducting inspection and walkthrough with local emergency responders.
8. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
9. Complete final cleaning requirements, including touchup painting.
10. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.

D. Inspection: Submit a written request for inspection to determine Substantial Completion a minimum of 10 days prior to date the work will be completed and ready for final inspection and tests. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare the Certificate of Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Architect, that must be completed or corrected before certificate will be issued.

1. Re-inspection: Request re-inspection when the Work identified in previous inspections as incomplete is completed or corrected.
2. Results of completed inspection will form the basis of requirements for final completion.

1.7 FINAL COMPLETION PROCEDURES

A. Submittals Prior to Final Completion: Before requesting final inspection for determining final completion, complete the following:

1. Submit a final Application for Payment according to Division 01 Section "Payment Procedures."
2. Certified List of Incomplete Items: Submit certified copy of Architect's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Architect. Certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
3. Certificate of Insurance: Submit evidence of final, continuing insurance coverage complying with insurance requirements.

4. Submit pest-control final inspection report..

B. Inspection: Submit a written request for final inspection to determine acceptance a minimum of 10 days prior to date the work will be completed and ready for final inspection and tests. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.

1. Re-inspection: Request re-inspection when the Work identified in previous inspections as incomplete is completed or corrected.

1.8 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

A. Organization of List: Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction.

1. Organize list of spaces in sequential order, starting with exterior areas first and proceeding from lowest floor to highest floor.
2. Organize items applying to each space by major element, including categories for ceiling, individual walls, floors, equipment, and building systems.
3. Include the following information at the top of each page:

   a. Project name.
   b. Date.
   c. Name of Architect.
   d. Name of Contractor.
   e. Page number.

4. Submit list of incomplete items in the following format:

   a. MS Excel electronic file. Architect, through Construction Manager, will return annotated file.
   b. PDF electronic file. Architect, through Construction Manager, will return annotated file.

1.9 SUBMITTAL OF PROJECT WARRANTIES

A. Time of Submittal: Submit written warranties on request of Architect for designated portions of the Work where commencement of warranties other than date of Substantial Completion is indicated, or when delay in submittal of warranties might limit Owner's rights under warranty.

B. Partial Occupancy: Submit properly executed warranties within 15 days of completion of designated portions of the Work that are completed and occupied or used by Owner during construction period by separate agreement with Contractor.

C. Organize warranty documents into an orderly sequence based on the table of contents of Project Manual.

1. Bind warranties and bonds in heavy-duty, three-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch (215-by-280-mm) paper.
2. Provide heavy paper dividers with plastic-covered tabs for each separate warranty. Mark tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product and the name, address, and telephone number of Installer.
3. Identify each binder on the front and spine with the typed or printed title "WARRANTIES," Project name, and name of Contractor.
4. Warranty Electronic File: Scan warranties and bonds and assemble complete warranty and bond submittal package into a single indexed electronic PDF file with links enabling navigation to each item. Provide bookmarked table of contents at beginning of document.

D. Provide additional copies of each warranty to include in operation and maintenance manuals.

E. Submit all information in both printed and digital form.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.

1. Use cleaning products that comply with Green Seal's GS-37, or if GS-37 is not applicable, use products that comply with the California Code of Regulations maximum allowable VOC levels.

PART 3 - EXECUTION

3.1 FINAL CLEANING

A. General: Perform final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.

B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.

1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a designated portion of Project:

    a. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.
    b. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
    c. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.
    d. Remove tools, construction equipment, machinery, and surplus material from Project site.
    e. Remove snow and ice to provide safe access to building.
    f. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
    g. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.
    h. Sweep concrete floors broom clean in unoccupied spaces.
    i. Vacuum carpet and similar soft surfaces, removing debris and excess nap; clean according to manufacturer's recommendations if visible soil or stains remain.
    j. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other noticeable, vision-obscuring materials. Polish mirrors and glass, taking care not to scratch surfaces.
    k. Remove labels that are not permanent.
    l. Wipe surfaces of mechanical and electrical equipment and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
    m. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.
    n. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.
    o. Clean ducts, blowers, and coils if units were operated without filters during construction or that display contamination with particulate matter on inspection.

        1) Clean HVAC system in compliance with NADCA Standard 1992-01. Provide written report on completion of cleaning.

    p. Clean light fixtures, lamps, globes, and reflectors to function with full efficiency.
    q. Leave Project clean and ready for occupancy.

C. Pest Control: Comply with pest control requirements in Division 01 Section "Temporary Facilities and Controls." Prepare written report.

D. Construction Waste Disposal: Comply with waste disposal requirements in Division 01 Section "Construction Waste Management and Disposal."

3.2 REPAIR OF THE WORK

A. Complete repair and restoration operations before requesting inspection for determination of Substantial Completion.

B. Repair or remove and replace defective construction. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment. Where damaged or worn items cannot be repaired or restored, provide replacements. Remove and replace operating components that cannot be repaired. Restore damaged construction and permanent facilities used during construction to specified condition.

1. Remove and replace chipped, scratched, and broken glass, reflective surfaces, and other damaged transparent materials.
2. Touch up and otherwise repair and restore marred or exposed finishes and surfaces. Replace finishes and surfaces that that already show evidence of repair or restoration.

    a. Do not paint over "UL" and other required labels and identification, including mechanical and electrical nameplates. Remove paint applied to required labels and identification.

3. Replace parts subject to operating conditions during construction that may impede operation or reduce longevity.
4. Replace burned-out bulbs, bulbs noticeably dimmed by hours of use, and defective and noisy starters in fluorescent and mercury vapor fixtures to comply with requirements for new fixtures.

END OF SECTION 017700

SECTION 017823 - OPERATION AND MAINTENANCE DATA

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.

1.2 SUMMARY

A. Section includes administrative and procedural requirements for preparing operation and maintenance manuals, including the following:

1. Operation and maintenance documentation directory.
2. Emergency manuals.
3. Operation manuals for systems, subsystems, and equipment.
4. Product maintenance manuals.
5. Systems and equipment maintenance manuals.

B. Related Requirements:

1. Division 01 Section "Multiple Contract Summary" for coordinating operation and maintenance manuals covering the Work of multiple contracts.
2. Division 01 Section "Submittal Procedures" for submitting copies of submittals for operation and maintenance manuals.
3. Division 01 Section "General Commissioning Requirements" for verification and compilation of data into operation and maintenance manuals.
4. Divisions 02 through 33 Sections for specific operation and maintenance manual requirements for the Work in those Sections.

1.3 DEFINITIONS

A. System: An organized collection of parts, equipment, or subsystems united by regular interaction.

B. Subsystem: A portion of a system with characteristics similar to a system.

1.4 CLOSEOUT SUBMITTALS

A. Manual Content: Operations and maintenance manual content is specified in individual Specification Sections to be reviewed at the time of Section submittals. Submit reviewed manual content formatted and organized as required by this Section.

1. Architect and Commissioning Authority will comment on whether content of operations and maintenance submittals are acceptable.

2. Where applicable, clarify and update reviewed manual content to correspond to revisions and field conditions.

B. Format: Submit operations and maintenance manuals in the following format:

1. PDF electronic file. Assemble each manual into a composite electronically indexed file. Submit on digital media acceptable to Architect.

a. Name each indexed document file in composite electronic index with applicable item name. Include a complete electronically linked operation and maintenance directory.
b. Enable inserted reviewer comments on draft submittals.

2. Three paper copies. Include a complete operation and maintenance directory. Enclose title pages and directories in clear plastic sleeves. Architect, through Construction Manager, will return two copies.

C. Initial Manual Submittal: Submit draft copy of each manual at least 30 days before commencing demonstration and training. Architect and Commissioning Authority will comment on whether general scope and content of manual are acceptable.

D. Final Manual Submittal: Submit each manual in final form prior to requesting inspection for Substantial Completion and at least 15 days before commencing demonstration and training. Architect and Commissioning Authority will return copy with comments.

1. Correct or revise each manual to comply with Architect's and Commissioning Authority's comments. Submit copies of each corrected manual within 15 days of receipt of Architect's and Commissioning Authority's comments and prior to commencing demonstration and training.

PART 2 - PRODUCTS

2.1 OPERATION AND MAINTENANCE DOCUMENTATION DIRECTORY

A. Directory: Prepare a single, comprehensive directory of emergency, operation, and maintenance data and materials, listing items and their location to facilitate ready access to desired information. Include a section in the directory for each of the following:

1. List of documents.
2. List of systems.
3. List of equipment.
4. Table of contents.

B. List of Systems and Subsystems: List systems alphabetically. Include references to operation and maintenance manuals that contain information about each system.

C. List of Equipment: List equipment for each system, organized alphabetically by system. For pieces of equipment not part of system, list alphabetically in separate list.

D. Tables of Contents: Include a table of contents for each emergency, operation, and maintenance manual.

E. Identification: In the documentation directory and in each operation and maintenance manual, identify each system, subsystem, and piece of equipment with same designation used in the Contract Documents. If no designation exists, assign a designation according to ASHRAE Guideline 4, "Preparation of Operating and Maintenance Documentation for Building Systems."

2.2 REQUIREMENTS FOR EMERGENCY, OPERATION, AND MAINTENANCE MANUALS

A. Organization: Unless otherwise indicated, organize each manual into a separate section for each system and subsystem, and a separate section for each piece of equipment not part of a system. Each manual shall contain the following materials, in the order listed:

1. Title page.
2. Table of contents.
3. Manual contents.

B. Title Page: Include the following information:

1. Subject matter included in manual.
2. Name and address of Project.
3. Name and address of Owner.
4. Date of submittal.
5. Name and contact information for Contractor.
6. Name and contact information for Construction Manager.
7. Name and contact information for Architect.
8. Name and contact information for Commissioning Authority.
9. Names and contact information for major consultants to the Architect that designed the systems contained in the manuals.
10. Cross-reference to related systems in other operation and maintenance manuals.

C. Table of Contents: List each product included in manual, identified by product name, indexed to the content of the volume, and cross-referenced to Specification Section number in Project Manual.

D. Manual Contents: Organize into sets of manageable size. Arrange contents alphabetically by system, subsystem, and equipment. If possible, assemble instructions for subsystems, equipment, and components of one system into a single binder.

E. Manuals, Electronic Files: Submit manuals in the form of a multiple file composite electronic PDF file for each manual type required.

1. Electronic Files: Use electronic files prepared by manufacturer where available. Where scanning of paper documents is required, configure scanned file for minimum readable file size.

2. File Names and Bookmarks: Enable bookmarking of individual documents based on file names. Name document files to correspond to system, subsystem, and equipment names used in manual directory and table of contents. Group documents for each system and subsystem into individual composite bookmarked files, then create composite manual, so that resulting bookmarks reflect the system, subsystem, and equipment names in a readily navigated file tree. Configure electronic manual to display bookmark panel on opening file.

F. Manuals, Paper Copy: Submit manuals in the form of hard copy, bound and labeled volumes.

1. Binders: Heavy-duty, three-ring, vinyl-covered, post-type binders, in thickness necessary to accommodate contents, sized to hold 8-1/2-by-11-inch (215-by-280-mm) paper; with clear plastic sleeve on spine to hold label describing contents and with pockets inside covers to hold folded oversize sheets.

   a. If two or more binders are necessary to accommodate data of a system, organize data in each binder into groupings by subsystem and related components. Cross-reference other binders if necessary to provide essential information for proper operation or maintenance of equipment or system.
   b. Identify each binder on front and spine, with printed title "OPERATION AND MAINTENANCE MANUAL," Project title or name, and subject matter of contents, and indicate Specification Section number on bottom of spine. Indicate volume number for multiple-volume sets.

2. Dividers: Heavy-paper dividers with plastic-covered tabs for each section of the manual. Mark each tab to indicate contents. Include typed list of products and major components of equipment included in the section on each divider, cross-referenced to Specification Section number and title of Project Manual.
3. Protective Plastic Sleeves: Transparent plastic sleeves designed to enclose diagnostic software storage media for computerized electronic equipment.
4. Supplementary Text: Prepared on 8-1/2-by-11-inch (215-by-280-mm) white bond paper.
5. Drawings: Attach reinforced, punched binder tabs on drawings and bind with text.

   a. If oversize drawings are necessary, fold drawings to same size as text pages and use as foldouts.
   b. If drawings are too large to be used as foldouts, fold and place drawings in labeled envelopes and bind envelopes in rear of manual. At appropriate locations in manual, insert typewritten pages indicating drawing titles, descriptions of contents, and drawing locations.

2.3 EMERGENCY MANUALS

A. Emergency Instructions: Describe and explain warnings, trouble indications, error messages, and similar codes and signals. Include responsibilities of Owner's operating personnel for notification of Installer, supplier, and manufacturer to maintain warranties.

2.4 OPERATION MANUALS

A. Content: In addition to requirements in this Section, include operation data required in individual Specification Sections and the following information:

1. System, subsystem, and equipment descriptions. Use designations for systems and equipment indicated on Contract Documents.
2. Performance and design criteria if Contractor has delegated design responsibility.
3. Operating standards.
4. Operating procedures.
5. Operating logs.
6. Wiring diagrams.
7. Control diagrams.
8. Piped system diagrams.
9. Precautions against improper use.
10. License requirements including inspection and renewal dates.

B. Descriptions: Include the following:

1. Product name and model number. Use designations for products indicated on Contract Documents.
2. Manufacturer's name.
3. Equipment identification with serial number of each component.
4. Equipment function.
5. Operating characteristics.
6. Limiting conditions.
7. Performance curves.
8. Engineering data and tests.
9. Complete nomenclature and number of replacement parts.

C. Operating Procedures: Include the following, as applicable:

1. Startup procedures.
2. Equipment or system break-in procedures.
3. Routine and normal operating instructions.
4. Regulation and control procedures.
5. Instructions on stopping.
6. Normal shutdown instructions.
7. Seasonal and weekend operating instructions.
8. Required sequences for electric or electronic systems.
9. Special operating instructions and procedures.

D. Systems and Equipment Controls: Describe the sequence of operation, and diagram controls as installed.

E. Piped Systems: Diagram piping as installed and identify color-coding where required for identification.

2.5 PRODUCT MAINTENANCE MANUALS

A. Content: Organize manual into a separate section for each product, material, and finish. Include source information, product information, maintenance procedures, repair materials and sources, and warranties and bonds, as described below.

B. Source Information: List each product included in manual identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual and drawing or schedule designation or identifier where applicable.

C. Product Information: Include the following, as applicable:

1. Product name and model number.
2. Manufacturer's name.
3. Color, pattern, and texture.
4. Material and chemical composition.
5. Reordering information for specially manufactured products.

D. Maintenance Procedures: Include manufacturer's written recommendations and the following:

1. Inspection procedures.
2. Types of cleaning agents to be used and methods of cleaning.
3. List of cleaning agents and methods of cleaning detrimental to product.
4. Schedule for routine cleaning and maintenance.
5. Repair instructions.

E. Repair Materials and Sources: Include lists of materials and local sources of materials and related services.

F. Warranties: Include copies of warranties and lists of circumstances and conditions that would affect validity of warranties.

1. Include procedures to follow and required notifications for warranty claims.

2.6 SYSTEMS AND EQUIPMENT MAINTENANCE MANUALS

A. Content: For each system, subsystem, and piece of equipment not part of a system, include source information, manufacturers' maintenance documentation, maintenance procedures, maintenance and service schedules, spare parts list and source information, maintenance service contracts, and warranty and bond information, as described below.

B. Source Information: List each system, subsystem, and piece of equipment included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent,

C. and cross-reference Specification Section number and title in Project Manual and drawing or schedule designation or identifier where applicable.

D. Manufacturers' Maintenance Documentation: Manufacturers' maintenance documentation including the following information for each component part or piece of equipment:

1. Standard maintenance instructions and bulletins.
2. Drawings, diagrams, and instructions required for maintenance, including disassembly and component removal, replacement, and assembly.
3. Identification and nomenclature of parts and components.
4. List of items recommended to be stocked as spare parts.

E. Maintenance Procedures: Include the following information and items that detail essential maintenance procedures:

1. Test and inspection instructions.
2. Troubleshooting guide.
3. Precautions against improper maintenance.
4. Disassembly; component removal, repair, and replacement; and reassembly instructions.
5. Aligning, adjusting, and checking instructions.
6. Demonstration and training video recording, if available.

F. Maintenance and Service Schedules: Include service and lubrication requirements, list of required lubricants for equipment, and separate schedules for preventive and routine maintenance and service with standard time allotment.

1. Scheduled Maintenance and Service: Tabulate actions for daily, weekly, monthly, quarterly, semiannual, and annual frequencies.
2. Maintenance and Service Record: Include manufacturers' forms for recording maintenance.

G. Spare Parts List and Source Information: Include lists of replacement and repair parts, with parts identified and cross-referenced to manufacturers' maintenance documentation and local sources of maintenance materials and related services.

H. Maintenance Service Contracts: Include copies of maintenance agreements with name and telephone number of service agent.

I. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.

1. Include procedures to follow and required notifications for warranty claims.

PART 3 - EXECUTION

3.1 MANUAL PREPARATION

A. Operation and Maintenance Documentation Directory: Prepare a separate manual that provides an organized reference to emergency, operation, and maintenance manuals.

B. Emergency Manual: Assemble a complete set of emergency information indicating procedures for use by emergency personnel and by Owner's operating personnel for types of emergencies indicated.

C. Product Maintenance Manual: Assemble a complete set of maintenance data indicating care and maintenance of each product, material, and finish incorporated into the Work.

D. Operation and Maintenance Manuals: Assemble a complete set of operation and maintenance data indicating operation and maintenance of each system, subsystem, and piece of equipment not part of a system.

1. Engage a factory-authorized service representative to assemble and prepare information for each system, subsystem, and piece of equipment not part of a system.
2. Prepare a separate manual for each system and subsystem, in the form of an instructional manual for use by Owner's operating personnel.

E. Manufacturers' Data: Where manuals contain manufacturers' standard printed data, include only sheets pertinent to product or component installed. Mark each sheet to identify each product or component incorporated into the Work. If data include more than one item in a tabular format, identify each item using appropriate references from the Contract Documents. Identify data applicable to the Work and delete references to information not applicable.

1. Prepare supplementary text if manufacturers' standard printed data are not available and where the information is necessary for proper operation and maintenance of equipment or systems.

F. Drawings: Prepare drawings supplementing manufacturers' printed data to illustrate the relationship of component parts of equipment and systems and to illustrate control sequence and flow diagrams. Coordinate these drawings with information contained in record Drawings to ensure correct illustration of completed installation.

1. Do not use original project record documents as part of operation and maintenance manuals.
2. Comply with requirements of newly prepared record Drawings in Division 01 Section "Project Record Documents."

G. Comply with Division 01 Section "Closeout Procedures" for schedule for submitting operation and maintenance documentation.

END OF SECTION 017823

SECTION 01 78 36 - WARRANTIES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes: Administrative and procedural requirements for warranties required by the Contract Documents, including manufacturers' standard warranties on products and special warranties.

B. Related Sections:
1. Section 01 33 00 – Submittal Procedures: Procedures for submitting warranties.

2. Section 01 77 00 – Closeout Procedures: Contract closeout procedures.

3. Divisions 02 through 49 Sections: Specific requirements for warranties on products and installations specified to be warranted.

4. Certifications and other commitments and agreements for continuing services to Owner are specified elsewhere in the Contract Documents.

C. Disclaimers and Limitations: Manufacturer's disclaimers and limitations on product warranties do not relieve the Contractor of the warranty on the Work that incorporates the products. Manufacturer's disclaimers and limitations on product warranties do not relieve suppliers, manufacturers, and subcontractors required to countersign special warranties with the Contractor.

1.3 DEFINITIONS

A. Standard product warranties are preprinted written warranties published by individual manufacturers for particular products and are specifically endorsed by the manufacturer to the Owner.

B. Special warranties are written warranties required by or incorporated in the Contract Documents, either to extend time limits provided by standard warranties or to provide greater rights for the Owner.

1.4 WARRANTY REQUIREMENTS

A. Related Damages and Losses: When correcting failed or damaged warranted construction, remove and replace construction that has been damaged as a result of such failure or must be removed and replaced to provide access for correction of warranted construction.

C. Reinstatement of Warranty: When Work covered by a warranty has failed and been corrected by replacement of rebuilding, reinstate the warranty by written endorsement. The reinstated warranty shall be equal to the original warranty with an equitable adjustment for depreciation.

D. Replacement Cost: Upon determination that Work covered by a warranty has failed, replace or rebuild the Work to an acceptable condition complying with requirements of the Contract Documents. The Contractor is responsible for the cost of replacing or rebuilding defective

E. Work regardless of whether the Owner has benefited from use of the Work through a portion of its anticipated useful service life.

F Owner's Recourse: Expressed warranties made to the Owner are in addition to implied warranties and shall not limit the duties, obligations, rights, and remedies otherwise available under the law. Expressed warranty periods shall not be interpreted as limitations on the time in which the Owner can enforce such other duties, obligations, rights, or remedies.

1. Rejection of Warranties: The Owner reserves the right to reject warranties and to limit selection to products with warranties not in conflict with requirements of the Contract Documents.

G Where the Contract Documents require a special warranty, or similar commitment on the Work or part of the Work, the Owner reserves the right to refuse to accept the Work, until the Contractor presents evidence that entitles required to countersign such commitments are willing to do so.

1.5 SUBMITTALS

A. Submit written warranties to the Architect prior to the date certified for Substantial Completion. If the Architect's Certificate of Substantial Completion designates a commencement date for warranties other than the date of Substantial Completion for the Work, or a designated portion of the Work, submit written warranties upon requires of the Architect.

1. When a designated portion of the Work is completed and occupied or used by the Owner, by separate agreement with the Contractor during the construction period, submit properly executed warranties to the Architect within 15 days of completion of that designated portion of the Work.

B. When the Contract Documents require the Contractor, or the Contractor and a subcontractor, supplier or manufacturer to execute a special warranty, prepare a written document that contains appropriate terms and identification, ready for execution by the required parties. Submit a draft to the Owner, through the Architect, for approval prior to final execution.

1. Refer to Divisions 02 through 49 Sections for specific content requirements and particular requirements for submitting special warranties.

C. Form of Submittal: At Final Completion compile 2 copies of each required warranty properly executed by the Contractor, or by the Contractor, subcontractor, supplier, or manufacturer. Organize the warranty documents into an orderly sequence based on the table of contents of the Project Manual.

F. Bind warranties and bonds in heavy-duty, commercial-quality, durable 3-ring, vinyl-covered loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2 by 11 paper.

1. Provide heavy paper dividers with plastic-covered tabs for each separate warranty. Mark the tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product, and the name, address and telephone number of the Installer.

2. Identify each binder on the front and spine with the typed or printed title "WARRANTIES," Project title or name, and name of the Contractor.

3. When warranted construction requires operation and maintenance manuals, provide additional copies of each required warranty, as necessary, for inclusion in each required manual.

PART 2 – PRODUCTS (Not Used)

PART 3 – EXECUTION (Not Used)

END OF SECTION

SECTION 017839 - PROJECT RECORD DOCUMENTS

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.

1.2 SUMMARY

A. Section includes administrative and procedural requirements for project record documents, including the following:

1. Record Drawings.
2. Record Specifications.
3. Record Product Data.
4. Miscellaneous record submittals.

B. Related Requirements:

1. Division 01 Section "Multiple Contract Summary" for coordinating project record documents covering the Work of multiple contracts.
2. Division 01 Section "Execution" for final property survey.
3. Division 01 Section "Closeout Procedures" for general closeout procedures.
4. Division 01 Section "Operation and Maintenance Data" for operation and maintenance manual requirements.
5. Divisions 02 through 33 Sections for specific requirements for project record documents of the Work in those Sections.

1.3 CLOSEOUT SUBMITTALS

A. Record Drawings: Comply with the following:

1. Number of Copies: Submit one set(s) of marked-up record prints.
2. Number of Copies: Submit copies of record Drawings as follows:

a. Initial Submittal:

1) Submit one paper-copy set(s) of marked-up record prints.
2) Submit PDF electronic files of scanned record prints and one of file prints.
3) Submit record digital data files and one set(s) of plots.
4) Architect will indicate whether general scope of changes, additional information recorded, and quality of drafting are acceptable.

B.

a. Final Submittal:

1) Submit three paper-copy set(s) of marked-up record prints.
2) Submit PDF electronic files of scanned record prints and three set(s) of prints.
3) Print each drawing, whether or not changes and additional information were recorded.

b. Final Submittal:

1) Submit one paper-copy set(s) of marked-up record prints.
2) Submit record digital data files and three set(s) of record digital data file plots.
3) Plot each drawing file, whether or not changes and additional information were recorded.

C. Record Specifications: Submit one paper copy, annotated PDF electronic files of Project's Specifications, including addenda and contract modifications.

D. Record Product Data: Submit one paper copy, annotated PDF electronic files and directories of each submittal.

1. Where record Product Data are required as part of operation and maintenance manuals, submit duplicate marked-up Product Data as a component of manual.

E. Miscellaneous Record Submittals: See other Specification Sections for miscellaneous record-keeping requirements and submittals in connection with various construction activities. Submit one paper copy, annotated PDF electronic files and directories of each submittal.

F. Reports: Submit written report weekly indicating items incorporated into project record documents concurrent with progress of the Work, including revisions, concealed conditions, field changes, product selections, and other notations incorporated.

PART 2 - PRODUCTS

2.1 RECORD DRAWINGS

A. Record Prints: Maintain one set of marked-up paper copies of the Contract Drawings and Shop Drawings, incorporating new and revised drawings as modifications are issued.

1. Preparation: Mark record prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to provide information for preparation of corresponding marked-up record prints.

a. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
b. Accurately record information in an acceptable drawing technique.
c. Record data as soon as possible after obtaining it.

d. Record and check the markup before enclosing concealed installations.
e. Cross-reference record prints to corresponding archive photographic documentation.

2. Content: Types of items requiring marking include, but are not limited to, the following:

a. Dimensional changes to Drawings.
b. Revisions to details shown on Drawings.
c. Depths of foundations below first floor.
d. Locations and depths of underground utilities.
e. Revisions to routing of piping and conduits.
f. Revisions to electrical circuitry.
g. Actual equipment locations.
h. Duct size and routing.
i. Locations of concealed internal utilities.
j. Changes made by Change Order or Construction Change Directive.
k. Changes made following Architect's written orders.
l. Details not on the original Contract Drawings.
m. Field records for variable and concealed conditions.
n. Record information on the Work that is shown only schematically.

3. Mark the Contract Drawings and Shop Drawings completely and accurately. Use personnel proficient at recording graphic information in production of marked-up record prints.
4. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.
5. Mark important additional information that was either shown schematically or omitted from original Drawings.
6. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.

B. Record Digital Data Files: Immediately before inspection for Certificate of Substantial Completion, review marked-up record prints with Architect and Construction Manager. When authorized, prepare a full set of corrected digital data files of the Contract Drawings, as follows:

1. Format: Same digital data software program, version, and operating system as the original Contract Drawings.
2. Format: DWG, Version Microsoft Windows operating system.
3. Format: Annotated PDF electronic file with comment function enabled.
4. Incorporate changes and additional information previously marked on record prints. Delete, redraw, and add details and notations where applicable.
5. Refer instances of uncertainty to Architect through Construction Manager for resolution.
6. Architect will furnish Contractor one set of digital data files of the Contract Drawings for use in recording information.

a. See Division 01 Section "Submittal Procedures" for requirements related to use of Architect's digital data files.
b. Architect will provide data file layer information. Record markups in separate layers.

C. Newly Prepared Record Drawings: Prepare new Drawings instead of preparing record Drawings where Architect determines that neither the original Contract Drawings nor Shop Drawings are suitable to show actual installation.

1. New Drawings may be required when a Change Order is issued as a result of accepting an alternate, substitution, or other modification.
2. Consult Architect and Construction Manager for proper scale and scope of detailing and notations required to record the actual physical installation and its relation to other construction. Integrate newly prepared record Drawings into record Drawing sets; comply with procedures for formatting, organizing, copying, binding, and submitting.

D. Format: Identify and date each record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location.

1. Record Prints: Organize record prints and newly prepared record Drawings into manageable sets. Bind each set with durable paper cover sheets. Include identification on cover sheets.
2. Format: Annotated PDF electronic file with comment function enabled.
3. Record Digital Data Files: Organize digital data information into separate electronic files that correspond to each sheet of the Contract Drawings. Name each file with the sheet identification. Include identification in each digital data file.
4. Identification: As follows:

a. Project name.
b. Date.
c. Designation "PROJECT RECORD DRAWINGS."
d. Name of Architect and Construction Manager.
e. Name of Contractor.

2.2 RECORD SPECIFICATIONS

A. Preparation: Mark Specifications to indicate the actual product installation where installation varies from that indicated in Specifications, addenda, and contract modifications.

1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
2. Mark copy with the proprietary name and model number of products, materials, and equipment furnished, including substitutions and product options selected.
3. Record the name of manufacturer, supplier, Installer, and other information necessary to provide a record of selections made.
4. For each principal product, indicate whether record Product Data has been submitted in operation and maintenance manuals instead of submitted as record Product Data.
5. Note related Change Orders, record Product Data, and record Drawings where applicable.

B. Format: Submit record Specifications as scanned PDF electronic file(s) of marked-up paper copy of Specifications.

2.3 RECORD PRODUCT DATA

A. Preparation: Mark Product Data to indicate the actual product installation where installation varies substantially from that indicated in Product Data submittal.

1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
2. Include significant changes in the product delivered to Project site and changes in manufacturer's written instructions for installation.
3. Note related Change Orders, record Specifications, and record Drawings where applicable.

B. Format: Submit record Product Data as scanned PDF electronic file(s) of marked-up paper copy of Product Data.

1. Include record Product Data directory organized by Specification Section number and title, electronically linked to each item of record Product Data.

2.4 MISCELLANEOUS RECORD SUBMITTALS

A. Assemble miscellaneous records required by other Specification Sections for miscellaneous record keeping and submittal in connection with actual performance of the Work. Bind or file miscellaneous records and identify each, ready for continued use and reference.

B. Format: Submit miscellaneous record submittals as scanned PDF electronic file(s) of marked-up miscellaneous record submittals.

1. Include miscellaneous record submittals directory organized by Specification Section number and title, electronically linked to each item of miscellaneous record submittals.

PART 3 - EXECUTION

3.1 RECORDING AND MAINTENANCE

A. Recording: Maintain one copy of each submittal during the construction period for project record document purposes. Post changes and revisions to project record documents as they occur; do not wait until end of Project.

B. Maintenance of Record Documents and Samples: Store record documents and Samples in the field office apart from the Contract Documents used for construction. Do not use project record documents for construction purposes. Maintain record documents in good order and in a clean, dry, legible condition, protected from deterioration and loss. Provide access to project record documents for Architect's and Construction Manager's reference during normal working hours.

END OF SECTION 017839

SECTION 017900 - DEMONSTRATION AND TRAINING

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.

1.2 SUMMARY

A. Section includes administrative and procedural requirements for instructing Owner's personnel, including the following:

1. Demonstration of operation of systems, subsystems, and equipment.
2. Training in operation and maintenance of systems, subsystems, and equipment.
3. All demonstration and training programs shall be submitted in digital audio/video format.

B. Related Requirements:

1. Divisions 02 through 33 Sections for specific requirements for demonstration and training for products in those Sections.

C. Unit Price for Instruction Time: Length of instruction time will be measured by actual time spent performing demonstration and training in required location. No payment will be made for time spent assembling educational materials, setting up, or cleaning up. See requirements in Division 01 Section "Unit Prices."

1.3 INFORMATIONAL SUBMITTALS

A. Instruction Program: Submit outline of instructional program for demonstration and training, including a list of training modules and a schedule of proposed dates, times, length of instruction time, and instructors' names for each training module. Include learning objective and outline for each training module.

1. Indicate proposed training modules using manufacturer-produced demonstration and training video recordings for systems, equipment, and products in lieu of video recording of live instructional module.

B. Qualification Data: For facilitator.

C. Attendance Record: For each training module, submit list of participants and length of instruction time.

D. Evaluations: For each participant and for each training module, submit results and documentation of performance-based test.

1.4 QUALITY ASSURANCE

A. Facilitator Qualifications: A firm or individual experienced in training or educating maintenance personnel in a training program similar in content and extent to that indicated for this Project, and whose work has resulted in training or education with a record of successful learning performance.

B. Instructor Qualifications: A factory-authorized service representative, complying with requirements in Division 01 Section "Quality Requirements," experienced in operation and maintenance procedures and training.

C. Pre-instruction Conference: Conduct conference at Project site to comply with requirements in Division 01 Section "Project Management and Coordination." Review methods and procedures related to demonstration and training including, but not limited to, the following:

1. Inspect and discuss locations and other facilities required for instruction.
2. Review and finalize instruction schedule and verify availability of educational materials, instructors' personnel, audiovisual equipment, and facilities needed to avoid delays.
3. Review required content of instruction.
4. For instruction that must occur outside, review weather and forecasted weather conditions and procedures to follow if conditions are unfavorable.

1.5 COORDINATION

A. Coordinate instruction schedule with Owner's operations. Adjust schedule as required to minimize disrupting Owner's operations and to ensure availability of Owner's personnel.

B. Coordinate instructors, including providing notification of dates, times, length of instruction time, and course content.

C. Coordinate content of training modules with content of approved emergency, operation, and maintenance manuals. Do not submit instruction program until operation and maintenance data has been reviewed and approved by Architect.

PART 2 - PRODUCTS

2.1 INSTRUCTION PROGRAM

A. Program Structure: Develop an instruction program that includes individual training modules for each system and for equipment not part of a system, as required by individual Specification Sections.

B. Training Modules: Develop a learning objective and teaching outline for each module. Include a description of specific skills and knowledge that participant is expected to master. For each

C. module, include instruction for the following as applicable to the system, equipment, or component:

1. Basis of System Design, Operational Requirements, and Criteria: Include the following:

   a. System, subsystem, and equipment descriptions.
   b. Performance and design criteria if Contractor is delegated design responsibility.
   c. Operating standards.
   d. Regulatory requirements.
   e. Equipment function.
   f. Operating characteristics.
   g. Limiting conditions.
   h. Performance curves.

2. Documentation: Review the following items in detail:

   a. Emergency manuals.
   b. Operations manuals.
   c. Maintenance manuals.
   d. Project record documents.
   e. Identification systems.
   f. Warranties and bonds.
   g. Maintenance service agreements and similar continuing commitments.

3. Emergencies: Include the following, as applicable:

   a. Instructions on meaning of warnings, trouble indications, and error messages.
   b. Instructions on stopping.
   c. Shutdown instructions for each type of emergency.
   d. Operating instructions for conditions outside of normal operating limits.
   e. Sequences for electric or electronic systems.
   f. Special operating instructions and procedures.

4. Operations: Include the following, as applicable:

   a. Startup procedures.
   b. Equipment or system break-in procedures.
   c. Routine and normal operating instructions.
   d. Regulation and control procedures.
   e. Control sequences.
   f. Safety procedures.
   g. Instructions on stopping.
   h. Normal shutdown instructions.
   i. Operating procedures for emergencies.
   j. Operating procedures for system, subsystem, or equipment failure.
   k. Seasonal and weekend operating instructions.
   l. Required sequences for electric or electronic systems.
   m. Special operating instructions and procedures.

5. Adjustments: Include the following:

    a. Alignments.
    b. Checking adjustments.
    c. Noise and vibration adjustments.
    d. Economy and efficiency adjustments.

6. Troubleshooting: Include the following:

    a. Diagnostic instructions.
    b. Test and inspection procedures.

7. Maintenance: Include the following:

    a. Inspection procedures.
    b. Types of cleaning agents to be used and methods of cleaning.
    c. List of cleaning agents and methods of cleaning detrimental to product.
    d. Procedures for routine cleaning
    e. Procedures for preventive maintenance.
    f. Procedures for routine maintenance.
    g. Instruction on use of special tools.

8. Repairs: Include the following:

    a. Diagnosis instructions.
    b. Repair instructions.
    c. Disassembly; component removal, repair, and replacement; and reassembly instructions.
    d. Instructions for identifying parts and components.
    e. Review of spare parts needed for operation and maintenance.

PART 3 - EXECUTION

3.1 PREPARATION

A. Assemble educational materials necessary for instruction, including documentation and training module. Assemble training modules into a training manual organized in coordination with requirements in Division 01 Section "Operations and Maintenance Data."

B. Set up instructional equipment at instruction location.

3.2 INSTRUCTION

A. Facilitator: Engage a qualified facilitator to prepare instruction program and training modules, to coordinate instructors, and to coordinate between Contractor and Owner for number of participants, instruction times, and location.

B. Engage qualified instructors to instruct Owner's personnel to adjust, operate, and maintain systems, subsystems, and equipment not part of a system.

1. Architect will furnish an instructor to describe basis of system design, operational requirements, criteria, and regulatory requirements.
2. Owner will furnish an instructor to describe Owner's operational philosophy.
3. Owner will furnish Contractor with names and positions of participants.

C. Scheduling: Provide instruction at mutually agreed on times. For equipment that requires seasonal operation, provide similar instruction at start of each season.

1. Schedule training with Owner through Construction Manager, with at least seven days' advance notice.

D. Training Location and Reference Material: Conduct training on-site in the completed and fully operational facility using the actual equipment in-place. Conduct training using final operation and maintenance data submittals.

E. Evaluation: At conclusion of each training module, assess and document each participant's mastery of module by use of a written performance-based test.

F. Cleanup: Collect used and leftover educational materials and give to Owner. Remove instructional equipment. Restore systems and equipment to condition existing before initial training use.

END OF SECTION 017900

SECTION 032000 - CONCRETE REINFORCING

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:

1. Steel reinforcement bars.
2. Welded-wire reinforcement.

B. Related Requirements:
1. Section 321313 "Concrete Paving" for reinforcing related to concrete pavement and walks. Ref. Civil Drawings.

1.3 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at **Project site.**

1. Review the following:

a. Special inspection and testing and inspecting agency procedures for field quality control.
b. Construction contraction and isolation joints.
c. Steel-reinforcement installation.

1.4 ACTION SUBMITTALS

A. Product Data: For the following:

1. Each type of steel reinforcement.
2. Epoxy repair coating.
3. Zinc repair material.
4. Bar supports.
5. Mechanical splice couplers.
6. Insulated connection system.

B. Shop Drawings: Comply with ACI SP-066:

1. Include placing drawings that detail fabrication, bending, and placement.

2. Include bar sizes, lengths, materials, grades, bar schedules, stirrup spacing, bent bar diagrams, bar arrangement, location of splices, lengths of lap splices, details of mechanical splice couplers, details of welding splices, tie spacing, hoop spacing, and supports for concrete reinforcement.
3. For insulated connection system, indicate general configuration, insulation dimensions, tension bars, compression pads, shear bars, and dimensions.

C. Construction Joint Layout: Indicate proposed construction joints required to build the structure.

1. Location of construction joints is subject to approval of the Architect.

D. Delegated-Design Submittal: For insulated connection system, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.5 INFORMATIONAL SUBMITTALS

A. Delegated-Design Engineer Qualifications: Include the following:

1. Experience providing delegated-design engineering services of the type indicated.
2. Documentation that delegated-design engineer is licensed in the **state** in which Project is located.

B. Welding certificates.

1. Reinforcement To Be Welded: Welding procedure specification in accordance with AWS D1.4/D1.4M

C. Material Test Reports: For the following, from a qualified testing agency:

1. Steel Reinforcement:

a. For reinforcement to be welded, mill test analysis for chemical composition and carbon equivalent of the steel in accordance with ASTM A706.

D. Field quality-control reports.

E. Minutes of preinstallation conference.

1.6 QUALITY ASSURANCE

A. Testing Agency Qualifications: An independent agency, **acceptable to authorities having jurisdiction,** qualified in accordance with ASTM C1077 and ASTM E329 for testing indicated.

B. Welding Qualifications: Qualify procedures and personnel in accordance with AWS D1.4/D 1.4M.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Steel Reinforcement: Deliver, store, and handle steel reinforcement to prevent bending and damage

1. Store reinforcement to avoid contact with earth.
2. Do not allow epoxy-coated reinforcement to be stored outdoors for more than 60 days without being stored under an opaque covering.
3. Do not allow dual-coated reinforcement to be stored outdoors for more than 60 days without being stored under an opaque covering.
4. Do not allow stainless steel reinforcement to come into contact with uncoated reinforcement.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Delegated Design: Engage a qualified professional engineer, as defined in Section 014000 "Quality Requirements," to design insulated connection system, including attachment to building construction.

B. Structural Performance of Insulating Connection System: Insulated connection system shall withstand the following loads and stresses:

1. Dead Loads: As indicated on Drawings.

a. Shear Load: As indicated on Drawings.
b. Bending Moment: As indicated on Drawings.

2. Live Loads: As indicated on Drawings.

a. Shear Load: As indicated on Drawings.
b. Bending Moment: As indicated on Drawings.

2.2 STEEL REINFORCEMENT

A. Reinforcing Bars: ASTM A615/A615M, **Grade 60** deformed.

B. Low-Alloy Steel Reinforcing Bars: ASTM A706, deformed.

C. Headed-Steel Reinforcing Bars: ASTM A970.

2.3 REINFORCEMENT ACCESSORIES

A. Joint Dowel Bars: ASTM A615/A615M, Grade 60, plain-steel bars, cut true to length with ends square and free of burrs.

B. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded-wire reinforcement in place.

1. Manufacture bar supports from steel wire, plastic, or precast concrete in accordance with CRSI's "Manual of Standard Practice," of greater compressive strength than concrete and as follows:

a. For concrete surfaces exposed to view, where legs of wire bar supports contact forms, use CRSI Class 1 plastic-protected steel wire, all-plastic bar supports, or CRSI Class 2 stainless steel bar supports.

C. Tie Wire: ASTM A1064/A1064M, annealed steel, not less than 0.0508 inch in diameter.

1. Finish: **Plain**

2.4 FABRICATING REINFORCEMENT

A. Fabricate steel reinforcement according to CRSI's "Manual of Standard Practice."

PART 3 - EXECUTION

3.1 PREPARATION

A. Protection of In-Place Conditions:

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

B. Clean reinforcement of loose rust and mill scale, earth, ice, and other foreign materials that reduce bond to concrete.

3.2 INSTALLATION OF STEEL REINFORCEMENT

A. Comply with CRSI's "Manual of Standard Practice" for placing and supporting reinforcement.

B. Accurately position, support, and secure reinforcement against displacement.

1. Locate and support reinforcement with bar supports to maintain minimum concrete cover.
2. Do not tack weld crossing reinforcing bars.

C. Preserve clearance between bars of not less than 1 inch, not less than one bar diameter, or not less than 1-1/3 times size of large aggregate, whichever is greater.

D. Provide concrete coverage in accordance with ACI 318.

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

F. Splices: Lap splices as indicated on Drawings.

1. Bars indicated to be continuous, and all vertical bars shall be lapped not less than 36 bar diameters at splices, or 24 inches, whichever is greater.
2. Stagger splices in accordance with ACI 318.
3. Mechanical Splice Couplers: Install in accordance with manufacturer's instructions.
4. Weld reinforcing bars in accordance with AWS D1.4, where indicated on Drawings.

G. Install insulated connection system in accordance with manufacturer's instructions.

H. Install welded-wire reinforcement in longest practicable lengths.

1. Support welded-wire reinforcement in accordance with CRSI "Manual of Standard Practice."

a. For reinforcement less than W4.0 or D4.0, continuous support spacing shall not exceed 12 inches.

2. Lap edges and ends of adjoining sheets at least one mesh spacing plus 2 inches for plain wire and 8 inches for deformed wire.
3. Offset laps of adjoining sheet widths to prevent continuous laps in either direction.
4. Lace overlaps with wire.

3.3 JOINTS

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

1. Place joints perpendicular to main reinforcement.
2. Continue reinforcement across construction joints unless otherwise indicated.
3. Do not continue reinforcement through sides of strip placements of floors and slabs.

B. 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.

3.4 INSTALLATION TOLERANCES

A. Comply with ACI 117.

3.5 FIELD QUALITY CONTROL

A. Special Inspections: Owner will engage a **qualified testing and inspecting agency** to perform field tests and inspections and prepare test reports.

B. Testing Agency: Engage a qualified testing and inspecting agency to perform tests and inspections and to submit reports.

C. Inspections:

1. Steel-reinforcement placement.

D. Manufacturer's Inspections: Engage manufacturer of insulated connection system to inspect completed installations prior to placement of concrete, and to provide written report that installation complies with manufacturer's written instructions.

END OF SECTION 032000

SECTION 033000 - 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:

1. Cast-in-place concrete, including concrete materials, mixture design, placement procedures, and finishes.

B. Related Requirements:
1. Section 032000 "Concrete Reinforcing" for steel reinforcing bars and welded-wire reinforcement.
2. Section 321313 "Concrete Paving" for concrete pavement and walks. Reference Civil Drawings.

1.3 DEFINITIONS

A. Cementitious Materials: Portland cement alone or in combination with one or more of the following: blended hydraulic cement, fly ash, slag cement, other pozzolans, and silica fume; materials subject to compliance with requirements.

B. Water/Cement Ratio (w/cm): The ratio by weight of water to cementitious materials.

1.4 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at **Project site**.

1. Require representatives of each entity directly concerned with cast-in-place concrete to attend, including the following:

a. Contractor's superintendent.
b. Independent testing agency responsible for concrete design mixtures.
c. Ready-mix concrete manufacturer.
d. Concrete Subcontractor.
e. Special concrete finish Subcontractor.

2. Review the following:

    a. Special inspection and testing and inspecting agency procedures for field quality control.
    b. Construction joints, control joints, isolation joints, and joint-filler strips.
    c. Semirigid joint fillers.
    d. Vapor-retarder installation.
    e. Anchor rod and anchorage device installation tolerances.
    f. Cold and hot weather concreting procedures.
    g. Concrete finishes and finishing.
    h. Curing procedures.
    i. Forms and form-removal limitations.
    j. Shoring and reshoring procedures.
    k. Methods for achieving specified floor and slab flatness and levelness.
    l. Floor and slab flatness and levelness measurements.
    m. Concrete repair procedures.
    n. Concrete protection.

1.5 ACTION SUBMITTALS

A. Product Data: For each of the following.

1. Portland cement.
2. Fly ash.
3. Slag cement.
4. Blended hydraulic cement.
5. Silica fume.
6. Performance-based hydraulic cement
7. Aggregates.
8. Admixtures:

    a. Include limitations of use, including restrictions on cementitious materials, supplementary cementitious materials, air entrainment, aggregates, temperature at time of concrete placement, relative humidity at time of concrete placement, curing conditions, and use of other admixtures.

9. Color pigments.
10. Fiber reinforcement.
11. Vapor retarders.
12. Floor and slab treatments.
13. Liquid floor treatments.
14. Curing materials.

    a. Include documentation from color pigment manufacturer, indicating that proposed methods of curing are recommended by color pigment manufacturer.

15. Joint fillers.
16. Repair materials.

B. Design Mixtures: For each concrete mixture, include the following:

1. Mixture identification.
2. Minimum 28-day compressive strength.
3. Durability exposure class.
4. Maximum w/cm.
5. Calculated equilibrium unit weight, for lightweight concrete.
6. Slump limit.
7. Air content.
8. Nominal maximum aggregate size.
9. Steel-fiber reinforcement content.
10. Synthetic micro-fiber content.
11. Indicate amounts of mixing water to be withheld for later addition at Project site if permitted.
12. Include manufacturer's certification that permeability-reducing admixture is compatible with mix design.
13. Include certification that dosage rate for permeability-reducing admixture matches dosage rate used in performance compliance test.
14. Intended placement method.
15. Submit alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.

C. Shop Drawings:

1. Construction Joint Layout: Indicate proposed construction joints required to construct the structure.

    a. Location of construction joints is subject to approval of the Architect.

D. Concrete Schedule: For each location of each Class of concrete indicated in "Concrete Mixtures" Article, including the following:

1. Concrete Class designation.
2. Location within Project.
3. Exposure Class designation.
4. Formed Surface Finish designation and final finish.
5. Final finish for floors.
6. Curing process.
7. Floor treatment if any.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For the following:

1. Installer: Include copies of applicable ACI certificates.
2. Ready-mixed concrete manufacturer.
3. Testing agency: Include copies of applicable ACI certificates.

B. Material Certificates: For each of the following, signed by manufacturers:

1. Cementitious materials.
2. Admixtures.
3. Fiber reinforcement.
4. Curing compounds.
5. Floor and slab treatments.
6. Bonding agents.
7. Adhesives.
8. Vapor retarders.
9. Semirigid joint filler.
10. Joint-filler strips.
11. Repair materials.

C. Material Test Reports: For the following, from a qualified testing agency:

1. Portland cement.
2. Fly ash.
3. Slag cement.
4. Blended hydraulic cement.
5. Silica fume.
6. Performance-based hydraulic cement.
7. Aggregates.
8. Admixtures:

a. Permeability-Reducing Admixture: Include independent test reports, indicating compliance with specified requirements, including dosage rate used in test.

D. Floor surface flatness and levelness measurements report, indicating compliance with specified tolerances.

E. Research Reports: For concrete admixtures in accordance with ICC's Acceptance Criteria AC198.

F. Preconstruction Test Reports: For each mix design.

G. Field quality-control reports.

H. Minutes of preinstallation conference.

1.7 QUALITY ASSURANCE

A. Installer Qualifications: A qualified installer who employs Project personnel qualified as a ACI-certified Flatwork Technician and Finisher and a supervisor who is a certified ACI Flatwork Concrete Finisher/Technician or an ACI Concrete Flatwork Technician.

1. Post-Installed Concrete Anchors Installers: ACI-certified Adhesive Anchor Installer.

B. Ready-Mixed Concrete Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C94/C94M requirements for production facilities and equipment.

1. Manufacturer certified in accordance with NRMCA's "Certification of Ready Mixed Concrete Production Facilities."

C. Laboratory Testing Agency Qualifications: A testing agency qualified in accordance with ASTM C1077 and ASTM E329 for testing indicated, and employing an ACI-certified Concrete Quality Control Technical Manager.

1. Personnel performing laboratory tests shall be an 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. Field Quality Control Testing Agency Qualifications: An independent agency, **acceptable to authorities having jurisdiction,** qualified in accordance with ASTM C1077 and ASTM E329 for testing indicated.

1. Personnel conducting field tests shall be qualified as an ACI Concrete Field Testing Technician, Grade 1, in accordance with ACI CPP 610.1 or an equivalent certification program.

1.8 PRECONSTRUCTION TESTING

A. Preconstruction Testing Service: Engage a qualified testing agency to perform preconstruction testing on each concrete mixture.

1. Include the following information in each test report:

a. Admixture dosage rates.
b. Slump.
c. Air content.
d. Seven-day compressive strength.
e. 28-day compressive strength.
f. Permeability.

1.9 DELIVERY, STORAGE, AND HANDLING

A. Comply with ASTM C94/C94M and ACI 301.

1.10 FIELD CONDITIONS

A. Cold-Weather Placement: Comply with ACI 301 and ACI 306.1 and as follows.

1. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.
2. When 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.
3. Do not use frozen materials or materials containing ice or snow.
4. Do not place concrete in contact with surfaces less than 35 deg F, other than reinforcing steel.
5. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in mixture designs.

B. Hot-Weather Placement: Comply with ACI 301 and ACI 305.1, and as follows:

1. Maintain concrete temperature at time of discharge to not exceed 95 deg F .
2. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade uniformly moist without standing water, soft spots, or dry areas.

PART 2 - PRODUCTS

2.1 CONCRETE, GENERAL

A. ACI Publications: Comply with the following unless modified by requirements in the Contract Documents:

1. ACI 301.

2.2 CONCRETE MATERIALS

A. Source Limitations:

1. Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant.
2. Obtain aggregate from single source.
3. Obtain each type of admixture from single source from single manufacturer.

B. Cementitious Materials:

1. Portland Cement: ASTM C150/C150M, **Type I** .

C. Normal-Weight Aggregates: ASTM C33, LIMESTONE. Provide aggregates from a single source.

1. Alkali-Silica Reaction: Comply with one of the following:

a. Expansion Result of Aggregate: Not more than 0.04 percent at one-year when tested in accordance with ASTM C1293.
b. Expansion Results of Aggregate and Cementitious Materials in Combination: Not more than 0.10 percent at an age of 16 days when tested in accordance with ASTM C1567.

c. Alkali Content in Concrete: Not more than 4 lb./cu. yd. for moderately reactive aggregate or 3 lb./cu. yd. for highly reactive aggregate, when tested in accordance with ASTM C1293 and categorized in accordance with ASTM C1778, based on alkali content being calculated in accordance with ACI 301

2. Maximum Coarse-Aggregate Size: **1-1/2 inches** .
3. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.

D. Air-Entraining Admixture: ASTM C260/C260M.

E. Chemical Admixtures: Certified by manufacturer to be compatible with other admixtures that do 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 C494/C494M, Type A.
2. Retarding Admixture: ASTM C494/C494M, Type B.
3. Water-Reducing and -Retarding Admixture: ASTM C494/C494M, Type D.
4. High-Range, Water-Reducing Admixture: ASTM C494/C494M, Type F.
5. High-Range, Water-Reducing and -Retarding Admixture: ASTM C494/C494M, Type G.
6. Plasticizing and Retarding Admixture: ASTM C1017/C1017M, Type II.
7. et-Accelerating Corrosion-Inhibiting Admixture: Commercially formulated, anodic inhibitor or mixed cathodic and anodic inhibitor; capable of forming a protective barrier and minimizing chloride reactions with steel reinforcement in concrete and complying with ASTM C494/C494M, Type C.

2.3 VAPOR RETARDERS

A. Sheet Vapor Retarder, Class A: ASTM E1745, Class A; not less than 15 mils thick. Include manufacturer's recommended adhesive or pressure-sensitive tape. Reference Section 072600.

2.4 FLOOR AND SLAB TREATMENTS

A. Reference Section 096723 for Resinous Flooring finish system.

2.5 CURING MATERIALS

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

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

C. Moisture-Retaining Cover: ASTM C171, polyethylene film burlap-polyethylene sheet.

1. Color:

a. Ambient Temperature Below 50 deg F : Black.
b. Ambient Temperature between 50 deg F and 85 deg F : Any color.
c. Ambient Temperature Above 85 deg F: White.

D. Water: Potable or complying with ASTM C1602

E. Clear, Waterborne, Membrane-Forming, Dissipating Curing Compound: ASTM C309, Type 1, Class B.

F. Clear, Waterborne, Membrane-Forming, Curing Compound: ASTM C309, Type 1, Class B, 18 to 25 percent solids, nondissipating[**, certified by curing compound manufacturer to not interfere with bonding of floor covering**].

2.6 RELATED MATERIALS

A. Expansion- and Isolation-Joint-Filler Strips: **ASTM D1752, 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**] [**aromatic polyurea with a Type A shore durometer hardness range of 90 to 95**] in accordance with ASTM D2240.

C. Bonding Agent: ASTM C1059/, Type II, non-redispersible, acrylic emulsion or styrene butadiene.

D. Epoxy Bonding Adhesive: ASTM C881, 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:

2.7 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, in accordance with ACI 301 .

1. Use a qualified testing agency for preparing and reporting proposed mixture designs, based on laboratory trial mixtures.

B. Admixtures: Use admixtures in accordance with manufacturer's written instructions.

1. Use 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, and concrete with a w/cm below 0.50.
4. Use corrosion-inhibiting admixture in concrete mixtures where indicated.
5. Use permeability-reducing admixture in concrete mixtures where indicated.
6.

2.8 CONCRETE MIXTURES

A. Class A: Normal-weight concrete used for footings, grade beams, and tie beams.

1. Exposure Class: ACI 318 .
2. Minimum Compressive Strength: **3000 psi** at 28 days.
3. Maximum w/cm: [**0.50**] .
4. Slump Limit: **4 inches , plus or minus 1 inch** .
5. Air Content:
6. **As indicated** at 28 days.

2.9 CONCRETE MIXING

A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete in accordance with ASTM C94/C94M **and ASTM C1116** and furnish batch ticket information.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verification of Conditions:

1. Before placing concrete, verify that installation of concrete forms, accessories, and reinforcement, and embedded items is complete and that required inspections have been performed.
2. Do not proceed until unsatisfactory conditions have been corrected.

3.2 INSTALLATION OF 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.

1. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.

2. Install anchor rods, accurately located, to elevations required and complying with tolerances in Section 7.5 of ANSI/AISC 303.
3. Install reglets to receive waterproofing and to receive through-wall flashings in outer face of concrete frame at exterior walls, where flashing is shown at lintels, shelf angles, and other conditions.

3.3 INSTALLATION OF VAPOR RETARDER

A. Sheet Vapor Retarders: Place, protect, and repair sheet vapor retarder in accordance with ASTM E1643 and manufacturer's written instructions.

1. Install vapor retarder with longest dimension parallel with direction of concrete pour.
2. Face laps away from exposed direction of concrete pour.
3. Lap vapor retarder over footings and grade beams not less than 6 inches, sealing vapor retarder to concrete.
4. Lap joints 6 inches and seal with manufacturer's recommended tape.
5. Terminate vapor retarder at the top of floor slabs, grade beams, and pile caps, sealing entire perimeter to floor slabs, grade beams, foundation walls, or pile caps.
6. Seal penetrations in accordance with vapor retarder manufacturer's instructions.
7. Protect vapor retarder during placement of reinforcement and concrete.

    a. Repair damaged areas by patching with vapor retarder material, overlapping damages area by 6 inches on all sides, and sealing to vapor retarder.

3.4 JOINTS

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

B. Construction Joints: Coordinate with floor slab pattern and concrete placement sequence.

1. Install so strength and appearance of concrete are not impaired, at locations indicated on Drawings or as approved by Architect.
2. Place joints perpendicular to main reinforcement.

    a. Continue reinforcement across construction joints unless otherwise indicated.
    b. Do not continue reinforcement through sides of strip placements of floors and slabs.

3. Form keyed joints as indicated. Embed keys at least 1-1/2 inches into concrete.
4. Locate joints for beams, slabs, joists, and girders at third points of spans. Offset joints in girders a minimum distance of twice the beam width from a beam-girder intersection.
5. Locate horizontal joints in walls and columns at underside of floors, slabs, beams, and girders and at the top of footings or floor slabs.
6. Space vertical joints in walls **as indicated on Drawings**. Unless otherwise indicated on Drawings, locate vertical joints beside piers integral with walls, near corners, and in concealed locations where possible.
7. Use a bonding agent at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.

8. Use epoxy-bonding adhesive at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.

C. Control Joints in Slabs-on-Ground: Form weakened-plane control joints, sectioning concrete into areas as indicated. Construct control joints for a depth equal to at least [**one-third**] of concrete thickness as follows:

1. Grooved Joints: Form control joints after initial floating by grooving and finishing each edge of joint to a radius of 1/8 inch. Repeat grooving of control joints after applying surface finishes. Eliminate groover tool marks on concrete surfaces.

2. Sawed Joints: Form control joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch- wide joints into concrete when cutting action does not tear, abrade, or otherwise damage surface and before concrete develops random cracks.

3.5 CONCRETE PLACEMENT

A. Before placing concrete, verify that installation of formwork, reinforcement, embedded items, and vapor retarder is complete and that required inspections are completed.

1. Immediately prior to concrete placement, inspect vapor retarder for damage and deficient installation, and repair defective areas.
2. Provide continuous inspection of vapor retarder during concrete placement and make necessary repairs to damaged areas as Work progresses.

B. Notify Architect and testing and inspection agencies 24 hours prior to commencement of concrete placement.

C. Do not add water to concrete during delivery, at Project site, or during placement unless approved by Architect in writing, but not to exceed the amount indicated on the concrete delivery ticket.

1. Do not add water to concrete after adding high-range water-reducing admixtures to mixture.

D. Before test sampling and placing concrete, water may be added at Project site, subject to limitations of ACI 301, but not to exceed the amount indicated on the concrete delivery ticket.

1. Do not add water to concrete after adding high-range water-reducing admixtures to mixture.

E. Deposit concrete continuously in one layer or in horizontal layers of such thickness that no new concrete is placed on concrete that has hardened enough to cause seams or planes of weakness.

1. If a section cannot be placed continuously, provide construction joints as indicated.
2. Deposit concrete to avoid segregation.

3. Deposit concrete in horizontal layers of depth not to exceed formwork design pressures and in a manner to avoid inclined construction joints.
4. Consolidate placed concrete with mechanical vibrating equipment in accordance with ACI 301.

    a. Do not use vibrators to transport concrete inside forms.
    b. Insert and withdraw vibrators vertically at uniformly spaced locations to rapidly penetrate placed layer and at least 6 inches into preceding layer.
    c. Do not insert vibrators into lower layers of concrete that have begun to lose plasticity.
    d. 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.

F. 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. Do not place concrete floors and slabs in a checkerboard sequence.
2. Consolidate concrete during placement operations, so concrete is thoroughly worked around reinforcement and other embedded items and into corners.
3. Maintain reinforcement in position on chairs during concrete placement.
4. Screed slab surfaces with a straightedge and strike off to correct elevations.
5. Level concrete, cut high areas, and fill low areas.
6. Slope surfaces uniformly to drains where required.
7. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane, before excess bleedwater appears on the surface.
8. Do not further disturb slab surfaces before starting finishing operations.

3.6 FINISHING FORMED SURFACES *ARCHITECT TO EDIT ALL FINISHES*

A. As-Cast Surface Finishes:

1. ACI 301 Surface Finish SF-1.0: As-cast concrete texture imparted by form-facing material.

    a. Patch voids larger than 1-1/2 inches wide or 1/2 inch deep.
    b. Remove projections larger than 1 inch.
    c. Tie holes do not require patching.
    d. Surface Tolerance: ACI 117 Class D.
    e. Apply to concrete surfaces [**not exposed to public view**].

B. Rubbed Finish: Apply the following to as cast surface finishes where exposed to public view and indicated on Drawings:

1. Smooth-Rubbed Finish:

    a. Perform no later than one day after form removal.
    b. Moisten concrete surfaces and rub with carborundum brick or another abrasive until producing a uniform color and texture.

c. If sufficient cement paste cannot be drawn from the concrete by the rubbing process, use a grout made from the same cementitious materials used in the in-place concrete.

C. Related Unformed Surfaces:

1. At tops of walls, horizontal offsets, and similar unformed surfaces adjacent to formed surfaces, strike off smooth and finish with a color and texture matching adjacent formed surfaces.
2. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces unless otherwise indicated.

3.7 FINISHING FLOORS AND SLABS *ARCHITECT TO EDIT*

A. Comply with ACI 302.1R recommendations for screeding, restraightening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.

B. Float Finish:

1. When bleedwater sheen has disappeared and concrete surface has stiffened sufficiently to permit operation of specific float apparatus, consolidate concrete surface with power-driven floats or by hand floating if area is small or inaccessible to power-driven floats.
2. Repeat float passes and restraightening until surface is left with a uniform, smooth, granular texture and complies with ACI 117 (ACI A117M) tolerances for conventional concrete.
3. Apply float finish to surfaces to receive trowel finish and to be covered with Resinous Flooring – Section 096723.

C. Trowel Finish:

1. After applying float finish, apply first troweling and consolidate concrete by hand or power-driven trowel.
2. Continue troweling passes and restraighten until surface is free of trowel marks and uniform in texture and appearance.
3. Grind smooth any surface defects that would telegraph through applied coatings or floor coverings.
4. Do not add water to concrete surface.
5. Do not apply hard-troweled finish to concrete, which has a total air content greater than 3 percent.
6. Apply a trowel finish to surfaces exposed to view or to be covered with thin-film-finish coating system.
7. Finish surfaces to the following tolerances, in accordance with ASTM E1155 (ASTM E1155M), for a randomly trafficked floor surface:

a. Slabs on Ground:

1) Specified overall values of flatness, F_F 25; and of levelness, F_L 20; with minimum local values of flatness, F_F 17; and of levelness, F_L 15. Retain

straightedge method in subparagraph below if deleting F-number system above.

8. Finish and measure surface, so gap at any point between concrete surface and an unleveled, freestanding, 10-ft.- (3.05-m-) long straightedge resting on two high spots and placed anywhere on the surface does not exceed [**1/4 inch (6 mm)**].

3.8 CONCRETE CURING

A. Protect freshly placed concrete from premature drying and excessive cold or hot temperatures.

1. Comply with ACI 301 and ACI 306.1 for cold weather protection during curing.
2. Comply with ACI 301 and ACI 305.1 for hot-weather protection during curing.

B. Evaporation Retarder: Apply evaporation retarder to unformed concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x H before and during finishing operations. Apply in accordance with manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.

C. Curing Unformed Surfaces: Comply with ACI 308.1 as follows:

1. Begin curing immediately after finishing concrete.
2. Interior Concrete Floors:

a. Floors to Receive Floor Coverings Specified in Other Sections: Contractor has option of the following:

1) Absorptive Cover: As soon as concrete has sufficient set to permit application without marring concrete surface, install prewetted absorptive cover over entire area of floor.

a) Lap edges and ends of absorptive cover not less than 12-inches .
b) Maintain absorptive cover water saturated, and in place, for duration of curing period, but not less than seven days.

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.

a) Immediately repair any holes or tears during curing period, using cover material and waterproof tape.
b) Cure for not less than seven days.

3) Ponding or Continuous Sprinkling of Water: Maintain concrete surfaces continuously wet for not less than seven days, utilizing one, or a combination of, the following:

a) Water.

b) Continuous water-fog spray.

b. Floors to Receive Penetrating Liquid Floor Treatments: Contractor has option of the following:

1) Absorptive Cover: As soon as concrete has sufficient set to permit application without marring concrete surface, install prewetted absorptive cover over entire area of floor.

a) Lap edges and ends of absorptive cover not less than 12 inches .
b) Maintain absorptive cover water saturated, and in place, for duration of curing period, but not less than seven days.

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.

a) Immediately repair any holes or tears during curing period, using cover material and waterproof tape.
b) Cure for not less than seven days.

3) Ponding or Continuous Sprinkling of Water: Maintain concrete surfaces continuously wet for not less than seven days, utilizing one, or a combination of, the following:

a) Water.
b) Continuous water-fog spray.

3.9 TOLERANCES

A. Conform to ACI 117 (ACI 117M).

3.10 APPLICATION OF LIQUID FLOOR TREATMENTS

A. Penetrating Liquid Floor Treatment: Prepare, apply, and finish penetrating liquid floor treatment in accordance with 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 **28** days' old.
3. Apply liquid until surface is saturated, scrubbing into surface until a gel forms; rewet; and repeat brooming or scrubbing.
4. Rinse with water; remove excess material until surface is dry.
5. Apply a second coat in a similar manner if surface is rough or porous.

B. Sealing Coat: Uniformly apply a continuous sealing coat of curing and sealing compound to hardened concrete by power spray or roller in accordance with manufacturer's written instructions.

3.11 JOINT FILLING

A. Prepare, clean, and install joint filler in accordance with manufacturer's written instructions.

1. Defer joint filling until concrete has aged at least [**one**] [**six**] month(s).
2. Do not fill joints until construction traffic has permanently ceased.

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

C. Install semirigid joint filler full depth in saw-cut joints and at least 2 inches (50 mm) deep in formed joints.

D. Overfill joint, and trim joint filler flush with top of joint after hardening.

3.12 CONCRETE SURFACE REPAIRS

A. Defective Concrete:

1. Repair and patch defective areas when approved by Architect.
2. Remove and replace concrete that cannot be repaired and patched to Architect's approval.

B. Patching Mortar: Mix dry-pack patching mortar, consisting of 1 part portland cement to 2-1/2 parts fine aggregate passing a No. 16 (1.18-mm) 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 (13 mm) in any dimension to solid concrete.

   a. Limit cut depth to 3/4 inch (19 mm).
   b. Make edges of cuts perpendicular to concrete surface.
   c. Clean, dampen with water, and brush-coat holes and voids with bonding agent.
   d. Fill and compact with patching mortar before bonding agent has dried.
   e. 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 matches surrounding color.

a. Patch a test area at inconspicuous locations to verify mixture and color match before proceeding with patching.
b. Compact mortar in place and strike off slightly higher than surrounding surface.

3. Repair defects on concealed formed surfaces that will affect concrete's durability and structural performance as determined by Architect.

D. Repairing Unformed Surfaces:

1. Test unformed surfaces, such as floors and slabs, for finish, and verify surface tolerances specified for each surface.

a. Correct low and high areas.
b. Test surfaces sloped to drain for trueness of slope and smoothness; use a sloped template.

2. Repair finished surfaces containing surface defects, including spalls, popouts, honeycombs, rock pockets, crazing, and cracks in excess of 0.01 inch (0.25 mm) wide or that penetrate to reinforcement or completely through unreinforced sections regardless of width, and other objectionable conditions.
3. After concrete has cured at least 14 days, correct high areas by grinding.
4. Correct localized low areas during, or immediately after, completing surface-finishing operations by cutting out low areas and replacing with patching mortar.

a. Finish repaired areas to blend into adjacent concrete.

5. Correct other low areas scheduled to receive floor coverings with a repair underlayment.

a. Prepare, mix, and apply repair underlayment and primer in accordance with manufacturer's written instructions to produce a smooth, uniform, plane, and level surface.
b. Feather edges to match adjacent floor elevations.

6. Correct other low areas scheduled to remain exposed with repair topping.

a. Cut out low areas to ensure a minimum repair topping depth of 1/4 inch (6 mm) to match adjacent floor elevations.
b. Prepare, mix, and apply repair topping and primer in accordance with manufacturer's written instructions to produce a smooth, uniform, plane, and level surface.

7. Repair defective areas, except random cracks and single holes 1 inch (25 mm) or less in diameter, by cutting out and replacing with fresh concrete.

a. Remove defective areas with clean, square cuts, and expose steel reinforcement with at least a 3/4-inch (19-mm) clearance all around.
b. Dampen concrete surfaces in contact with patching concrete and apply bonding agent.
c. Mix patching concrete of same materials and mixture as original concrete, except without coarse aggregate.

d. Place, compact, and finish to blend with adjacent finished concrete.
e. Cure in same manner as adjacent concrete.

8. Repair random cracks and single holes 1 inch (25 mm) or less in diameter with patching mortar.

a. Groove top of cracks and cut out holes to sound concrete, and clean off dust, dirt, and loose particles.
b. Dampen cleaned concrete surfaces and apply bonding agent.
c. Place patching mortar before bonding agent has dried.
d. Compact patching mortar and finish to match adjacent concrete.
e. Keep patched area continuously moist for at least 72 hours.

E. Perform structural repairs of concrete, subject to Architect's approval, using epoxy adhesive and patching mortar.

F. Repair materials and installation not specified above may be used, subject to Architect's approval.

3.13 FIELD QUALITY CONTROL

A. Special Inspections: Owner will engage a special inspector to perform field tests and inspections and prepare testing and inspection reports.

B. Testing Agency: **Owner will engage** a qualified testing and inspecting agency to perform tests and inspections and to submit reports.

1. Testing agency shall immediately report to Architect, Contractor, and concrete manufacturer any failure of Work to comply with Contract Documents.
2. Testing agency shall report results of tests and inspections, in writing, to Owner, Architect, Contractor, and concrete manufacturer within 48 hours of inspections and tests.

a. Test reports shall include reporting requirements of ASTM C31/C31M and ASTM C39/C39M, including the following as applicable to each test and inspection:

1) Project name.
2) Name of testing agency.
3) Names and certification numbers of field and laboratory technicians performing inspections and testing.
4) Name of concrete manufacturer.
5) Date and time of inspection, sampling, and field testing.
6) Date and time of concrete placement.
7) Location in Work of concrete represented by samples.
8) Date and time sample was obtained.
9) Truck and batch ticket numbers.
10) Design compressive strength at 28 days.
11) Concrete mixture designation, proportions, and materials.
12) Field test results.

13) Information on storage and curing of samples before testing, including curing method and maximum and minimum temperatures during initial curing period.
14) Type of fracture and compressive break strengths at seven days and 28 days.

C. Batch Tickets: For each load delivered, submit three copies of batch delivery ticket to testing agency, indicating quantity, mix identification, admixtures, design strength, aggregate size, design air content, design slump at time of batching, and amount of water that can be added at Project site.

D. Inspections:

1. Headed bolts and studs.
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.
6. Batch Plant Inspections: On a random basis, as determined by Architect.

E. Concrete Tests: Testing of composite samples of fresh concrete obtained in accordance with ASTM C 172/C 172M shall be performed in accordance with 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 provides 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 C143/C143M:

   a. One test at point of delivery from concrete truck for each composite sample, but not less than one test for each day's pour of each concrete mixture.
   b. Perform additional tests when concrete consistency appears to change.

3. Air Content: ASTM C231/C231M pressure method, for normal-weight concrete; [**ASTM C173/C173M volumetric method, for structural lightweight concrete**].

   a. 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 C1064/C1064M:

   a. One test hourly when air temperature is 40 deg F and below or 80 deg F and above, and one test for each composite sample.

5. Compression Test Specimens: ASTM C31/C31M:

a. Cast and laboratory cure two sets of [**four**] 6-inch by 12-inch cylinder specimens for each composite sample.
b. Cast and field cure [**two**] <**Insert number**> sets of [**two**] [**three**] [**four**] standard cylinder specimens for each composite sample.

6. Compressive-Strength Tests: ASTM C39/C39M.
   a. Test one set of two field-cured specimens at seven days and one set of two 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 (3.4 MPa) if specified compressive strength is 5000 psi (34.5 MPa), or no compressive strength test value is less than 1 percent of specified compressive strength if specified compressive strength is greater than 5000 psi (34.5 MPa).
9. Nondestructive Testing: Impact 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.
10. Additional Tests:

    a. 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.
    b. Testing and inspecting agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C42/C42M or by other methods as directed by Architect.

       1) Acceptance criteria for concrete strength shall be in accordance with ACI 301, section 1.6.6.3.

11. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
12. Correct deficiencies in the Work that test reports and inspections indicate do not comply with the Contract Documents.

F. Measure floor and slab flatness and levelness in accordance with ASTM E1155 within [**72**] hours of completion of floor finishing and promptly report test results to Architect.

3.14 PROTECTION

A. Protect concrete surfaces as follows:

1. Protect from petroleum stains.
2. Diaper hydraulic equipment used over concrete surfaces.
3. Prohibit vehicles from interior concrete slabs.
4. Prohibit use of pipe-cutting machinery over concrete surfaces.
5. Prohibit placement of steel items on concrete surfaces.
6. Prohibit use of acids or acidic detergents over concrete surfaces.
7. 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.
8. Protect concrete surfaces scheduled to receive surface hardener or polished concrete finish using Floor Slab Protective Covering.

END OF SECTION 033000

SECTION 042113 – BRICK VENEER, BREEZE BLOCKS, & GLASS BLOCK

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:

1. Modular face brick – match existing.
2. Mortar and grout.
3. Ties and anchors.
4. Embedded flashing.
5. Miscellaneous masonry accessories.
6. Concrete masonry unit “breeze blocks” w/ bird screen.
7. Glass blocks.
8. Steel reinforcing bars.
9. Masonry joint reinforcement.

B. Related Sections:

1. Division 05 Section "Metal Fabrications" for furnishing steel lintels and shelf angles for brick masonry.
2. Division 07 Section “Air and Moisture Barrier Coatings” for air and moisture barrier system on all exterior wall substrates. This section also includes sheet membrane flashings.
3. Division 07 Section “Sheet Metal Flashing and Trim" for exposed sheet metal flashing and for furnishing manufactured reglets installed in masonry joints.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

B. Shop Drawings: For the following:

1. Masonry Units: Show sizes, profiles, coursing, and locations of special shapes.
2. Fabricated Flashing: Detail corner units, end-dam units, and other special applications.
3. Show locations and installation of control and expansion joints including plans, elevations, sections, details of components, and attachments to other work.

C. Samples for Initial Selection:
   1. Face brick match existing modular.
   2. Mortar.
   3. Weep holes/vents.

D. Samples for Verification: For each type and color of the following:
   1. Face brick.
   2. Special brick shapes.
   3. Match existing. Make Samples using same sand and mortar ingredients to be used on Project.
   4. Weep holes and vents.
   5. Accessories embedded in masonry.

1.4 INFORMATIONAL SUBMITTALS

A. List of Materials Used in Constructing Mockups: List generic product names together with manufacturers, manufacturers' product names, model numbers, lot numbers, batch numbers, source of supply, and other information as required to identify materials used. Include mix proportions for mortar and grout and source of aggregates.

   1. Submittal is for information only. Neither receipt of list nor approval of mockup constitutes approval of deviations from the Contract Documents unless such deviations are specifically brought to the attention of Architect and approved in writing.

B. Material Certificates: For each type and size of the following:

   1. Masonry units.

      a. Include data on material properties, material test reports substantiating compliance with requirements.
      b. For brick, include size-variation data verifying that actual range of sizes falls within specified tolerances.
      c. For exposed brick, include test report for efflorescence according to ASTM C 67.
      d. For surface-coated brick, include test report for durability of surface appearance after 50-cycles of freezing and thawing per ASTM C 67, or a list of addresses of buildings in Project's area where proposed brick has been used successfully and with a history of durability.

   2. Cementitious materials. Include brand, type, and name of manufacturer.
   3. Pre-blended, dry mortar mixes. Include description of type and proportions of ingredients.
   4. Grout mixes. Include description of type and proportions of ingredients.
   5. Anchors, ties, and metal accessories.

C. Cold-Weather and Hot-Weather Procedures: Detailed description of methods, materials, and equipment to be used to comply with requirements.

1.5 PERFORMANCE REQUIREMENTS

A. Provide structural unit masonry that develops indicated net-area compressive strengths at 28 days.

1. Determine net-area compressive strength of masonry from average net-area compressive strengths of masonry units and mortar types (unit-strength method) according to Tables 1 and 2 in ACI 530.1/ASCE 6/TMS 602.

2. Determine net-area compressive strength of masonry by testing masonry prisms according to ASTM C 1314.

1.6 QUALITY ASSURANCE

A. Source Limitations for Masonry Units: Obtain exposed masonry units of a uniform texture and color, or a uniform blend within the ranges accepted for these characteristics, from single source from single manufacturer for each product required.

B. Source Limitations for Mortar Materials: Obtain mortar ingredients of a uniform quality, including color for exposed masonry, from single manufacturer for each cementitious component and from single source or producer for each aggregate.

C. Masonry Standard: Comply with ACI 530.1/ASCE 6/TMS 602 unless modified by requirements in the Contract Documents.

D. Sample Panels: Build sample panels to verify selections made under sample submittals and to demonstrate aesthetic effects. Comply with requirements in Division 01 Section "Quality Requirements" for mockups.

1. Build sample panels for each type of exposed unit masonry construction in sizes approximately **48 inches (1200 mm)** long by **48 inches (1200 mm)**] high by full thickness.
2. Clean one-half of exposed faces of panels with masonry cleaner indicated.
3. Protect approved sample panels from the elements with weather-resistant membrane.
4. Approval of sample panels is for color, texture, and blending of masonry units; relationship of mortar and sealant colors to masonry unit colors; tooling of joints; aesthetic qualities of workmanship; and other material and construction qualities specifically approved by Architect in writing.

   a. Approval of sample panels does not constitute approval of deviations from the Contract Documents contained in sample panels unless such deviations are specifically approved by Architect in writing.

E. Mockups: Build mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.

1. Build mockup of typical wall area as shown on Drawings.

2. Build mockups for each type of exposed unit masonry construction in sizes approximately **48 inches (1200 mm)** long by **48 inches (1200 mm)** high by full thickness, including accessories.

    a. Include a sealant-filled joint at least 16 inches (400 mm) long in each mockup.
    b. Include lower corner of window opening at upper corner of exterior wall mockup. Make opening approximately 12 inches (300 mm) wide by 16 inches (400 mm) high.
    c. Include through-wall flashing installed for a 24-inch (600-mm) length in corner of exterior wall mockup approximately 16 inches (400 mm) down from top of mockup, with a 12-inch (300-mm) length of flashing left exposed to view (omit masonry above half of flashing).
    d. Include metal studs, sheathing, sheathing joint-and-penetration treatment, air and moisture barrier, veneer anchors, flashing, cavity drainage material, and weep holes in mockup.
3. Clean one-half of exposed faces of mockups with masonry cleaner as indicated.
4. Protect accepted mockups from the elements with weather-resistant membrane.
5. Approval of mockups is for color, texture, and blending of masonry units; relationship of mortar and sealant colors to masonry unit colors; tooling of joints; and aesthetic qualities of workmanship.

    a. Approval of mockups is also for other material and construction qualities specifically approved by Architect in writing.
    b. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless such deviations are specifically approved by Architect in writing.

6. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Store masonry units on elevated platforms in a dry location. If units are not stored in an enclosed location, cover tops and sides of stacks with waterproof sheeting, securely tied. If units become wet, do not install until they are dry.

B. Store cementitious materials on elevated platforms, under cover, and in a dry location. Do not use cementitious materials that have become damp.

C. Store aggregates where grading and other required characteristics can be maintained, and contamination avoided.

D. Deliver pre-blended, dry mortar mix in moisture-resistant containers designed for use with dispensing silos. Store pre-blended, dry mortar mix in delivery containers on elevated platforms, under cover, and in a dry location or in covered weatherproof dispensing silos.

E. Store masonry accessories, including metal items, to prevent corrosion and accumulation of dirt and oil.

1.8 PROJECT CONDITIONS

A. Protection of Masonry: During construction, cover tops of walls, projections, and sills with waterproof sheeting at end of each day's work. Cover partially completed masonry when construction is not in progress.

1. Extend cover a minimum of 24 inches (600 mm) down both sides of walls and hold cover securely in place.
2. Where one wythe of multi-wythe masonry walls is completed in advance of other wythes, secure cover a minimum of 24 inches (600 mm) down face next to unconstructed wythe and hold cover in place.

B. Stain Prevention: Prevent grout, mortar, and soil from staining the face of masonry to be left exposed or painted. Immediately remove grout, mortar, and soil that come in contact with such masonry.

1. Protect base of walls from rain-splashed mud and from mortar splatter by spreading coverings on ground and over wall surface.
2. Protect sills, ledges, and projections from mortar droppings.
3. Protect surfaces of window and door frames, as well as similar products with painted and integral finishes, from mortar droppings.
4. Turn scaffold boards near the wall on edge at the end of each day to prevent rain from splashing mortar and dirt onto completed masonry.

C. Cold-Weather Requirements: Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen substrates. Remove and replace unit masonry damaged by frost or by freezing conditions. Comply with cold-weather construction requirements contained in ACI 530.1/ASCE 6/TMS 602.

1. Cold-Weather Cleaning: Use liquid cleaning methods only when air temperature is 40 deg F (4 deg C) and higher and will remain so until masonry has dried, but not less than seven days after completing cleaning.

D. Hot-Weather Requirements: Comply with hot-weather construction requirements contained in ACI 530.1/ASCE 6/TMS 602.

PART 2 - PRODUCTS

2.1 MASONRY UNITS, GENERAL

A. Defective Units: Referenced masonry unit standards may allow a certain percentage of units to contain chips, cracks, or other defects exceeding limits stated in the standard. Do not use units where such defects will be exposed in the completed Work.

B. Fire-Resistance Ratings: Where indicated, provide units that comply with requirements for fire-resistance ratings indicated as determined by testing according to ASTM E 119, by equivalent masonry thickness, or by other means, as acceptable to authorities having jurisdiction.

2.2 CONCRETE MASONRY UNITS (Breeze/Ventilation Blocks)

A. Decorative CMUs: ASTM C 90.

1. Products: Subject to compliance with requirements, provide the following

2. Manufacturer: Carroll's Building Materials, St. Petersburg, FL. "8-inch Maze" https://carrollsbuildingmaterials.com/concrete-block/architectural-screen-blocks or approved equal. Include galvanized bird screens.
3. Density Classification: Medium weight.
4. Size (Width): Manufactured to dimensions specified on drawings.
5. Integral Colors: As selected by Architect from manufacturer's full range, if required.
6. Also reference Section 042200.

2.3 BRICK UNITS

A. General: Provide shapes indicated and as follows, with exposed surfaces matching finish and color of exposed faces of adjacent units.

1. For ends of sills and caps and for similar applications that would otherwise expose unfinished brick surfaces, provide units without cores or frogs and with exposed surfaces finished.
2. Provide special shapes for applications where stretcher units cannot accommodate special conditions, including those at corners, movement joints, bond beams, sashes, and lintels.
3. Provide special shapes for applications requiring brick of size, form, color, and texture on exposed surfaces that cannot be produced by sawing.
4. Provide special shapes for applications where shapes produced by sawing would result in sawed surfaces being exposed to view.

B. Face Brick: Facing brick, and glazed brick units complying with ASTM C 216, or hollow brick complying with ASTM C 652, Class H40V (void areas between 25 and 40 percent of gross cross-sectional area).

1. Products: Subject to compliance with requirements, provide the following:

   a. Reference Finish Schedule on Drawings for brick types, sizes and color requirements.

2. Grade: MW.
3. Type: SBX face.
4. Initial Rate of Absorption: Less than 30 g/30 sq. in. (30 g/194 sq. cm) per minute when tested per ASTM C 67.

5. Efflorescence: Provide brick that has been tested according to ASTM C 67 and is rated "not effloresced."
6. Surface Coating: Brick with colors or textures produced by application of coatings shall withstand 50 cycles of freezing and thawing per ASTM C 67 with no observable difference in the applied finish when viewed from 10 feet (3 m).
7. Application: Use where brick is exposed unless otherwise indicated.

2.4 GLASS UNIT MASONRY

A. "Vistabrik Glass Block", 8" x 8" x 4" as manufactured by Pittsburg Corning through Quality Glass Block & Window https://www.qualityglassblock.com/blog/vistabrik-glass-blocks-offer-maximum-security 815-416-1007.

2.5 MORTAR MATERIALS

A. Portland Cement: ASTM C 150, Type I or II, except Type III may be used for cold-weather construction. Provide natural color or white cement as required to produce mortar color indicated.

B. Hydrated Lime: ASTM C 207, Type S.

C. Portland Cement-Lime Mix: Packaged blend of Portland cement and hydrated lime containing no other ingredients.

D. Masonry Cement: ASTM C 91.

E. Mortar Cement: ASTM C 1329.

F. Aggregate for Mortar: ASTM C 144.

1. For mortar that is exposed to view, use washed aggregate consisting of natural sand or crushed stone.
2. For joints less than 1/4 inch (6 mm) thick, use aggregate graded with 100 percent passing the No. 16 (1.18-mm) sieve.
3. White-Mortar Aggregates: Natural white sand or crushed white stone.

G. Cold-Weather Admixture: Non-chloride, non-corrosive, accelerating admixture complying with ASTM C 494/C 494M, Type C, and recommended by manufacturer for use in masonry mortar of composition indicated.

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. Euclid Chemical Company (The); Accelguard 80.
b. Grace Construction Products, W. R. Grace & Co. - Conn.; Morset.
c. Sonneborn Products, BASF Aktiengesellschaft; Trimix-NCA.

2.6 REINFORCEMENT

A. Masonry Joint Reinforcement, General: ASTM A 951/A 951M.

B. Masonry Joint Reinforcement for Veneers Anchored with Hot Dipped Galvanized Anchors.

2.7 TIES AND ANCHORS

A. Materials: Provide ties and anchors specified in this article that are made from materials that comply with the following unless otherwise indicated:
   1. Hot-Dip Galvanized, Steel Wire: ASTM A 82/A 82M; with ASTM A 153/A 153M, Class B-2 coating.
   2. Steel Sheet, Galvanized after Fabrication: ASTM A 1008/A 1008M, Commercial Steel, with ASTM A 153/A 153M, Class B coating.

B. Adjustable Masonry-Veneer Anchors:

   1. General: Provide anchors that allow vertical adjustment but resist tension and compression forces perpendicular to plane of wall, for attachment over sheathing to metal studs and concrete substrates. Anchors shall also be designed to allow installation of rigid insulation board after anchor plates have been installed:

      a. Structural Performance Characteristics: Capable of withstanding a 100-lbf (445-N) load in both tension and compression without deforming or developing play in excess of 0.05 inch (1.3 mm).

   2. Screw-Attached, Masonry-Veneer Anchors: Units consisting of a HDG steel wire tie and a metal anchor section.

      a. Products: Hot Dipped Galvanized Adjustable Masonry Veneer Anchor products from the following manufacturers:

         1) Dayton Superior Corporation, Dur-O-Wal Division
         2) Heckmann Building Products Inc.
         3) Hohmann & Barnard, Inc.

   3. Polymer-Coated, Steel Drill Screws for Steel Studs: ASTM C 954 except manufactured with hex washer head and neoprene or EPDM washer, No. 10 (4.83-mm) diameter by length required to penetrate steel stud flange with not less than three exposed threads, and with organic polymer coating with salt-spray resistance to red rust of more than 800 hours per ASTM B 117.

      a. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

         1) ITW Buildex; Teks Maxiseal with Climaseal finish.

2) Leland Industries Inc.; Master Drillers with DT2000 Longlife Coating and Master Seal Bonded Washer.
3) Textron Inc., Textron Fastening Systems; Elco Dril-Flex with Stalgard finish.

4. HDG Steel Drill Screws for Concrete and Concrete Masonry Units: Use Tapcon Steel Concrete Screws, or approved equal.

2.8 EMBEDDED FLASHING MATERIALS

A. Flexible Membrane Flashing: Use the following unless otherwise indicated:

1. Rubberized-Asphalt Flashing: Composite flashing product consisting of a pliable, adhesive rubberized-asphalt compound, bonded to a high-density, cross-laminated polyethylene film to produce an overall thickness of not less than **0.040 inch (1.02 mm)**. Reference Section 072729 – Air-Barrier Coatings for sheet membrane flashing manufacturer. Membrane flashing to be used for through wall flashings. A prefinished sheet metal drip edge will be flashed within the membrane flashing at lintels and other penetrations to provide additional protection.

2. Accessories: Provide preformed corners, end dams, other special shapes, and seaming materials produced by flashing manufacturer.

B. Sheet Metal Flashing: Provide prefinished metal flashing complying with SMACNA's "Architectural Sheet Metal Manual, Division 07 Section "Sheet Metal Flashing and Trim. Metallic-Coated Steel Sheet: Restricted flatness steel sheet, metallic coated by the hot-dip process and pre-painted by the coil-coating process to comply with ASTM A 755/A 755M.

1. Zinc-Coated (Galvanized) Steel Sheet: ASTM A 653/A 653M, G90 (Z275) coating designation; structural quality.

2. Metallic-Coated Steel Sheet: Restricted flatness steel sheet, metallic coated by the hot-dip process and pre-painted by the coil-coating process to comply with ASTM A 755/A 755M.
3. Surface: Smooth, flat.
4. Coil-Coated Finish: Two-Coat Fluoropolymer: AAMA 621. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
5. Fabricate prefinished metal drip edges and sealant stops extending at least 3 inches (76 mm) into wall, with outer edge bent down 30 degrees and hemmed.

C. Application: Unless otherwise indicated, use the following:

1. Where flashing is indicated to receive counterflashing, use metal flashing.
2. Where flashing is indicated to be turned down at or beyond the wall face, use metal flashing.
3. Where flashing is partly exposed and is indicated to terminate at the wall face, use metal flashing with a drip edge.
4. Where flashing is fully concealed, use flexible flashing.

D. Sealants for Sheet Metal Flashings: As specified in Division 07 Section "Sheet Metal Flashing and Trim."
   1. Elastomeric Sealant: ASTM C 920, chemically curing silicone sealant; of type, grade, class, and use classifications required to seal joints in sheet metal flashing and trim and remain watertight. Reference Section 079200 – Joint Sealants.

E. Adhesives, Primers, and Seam Tapes for Flashings: Flashing manufacturer's standard products or products recommended by flashing manufacturer for bonding flashing sheets to each other and to substrates.

2.9 MISCELLANEOUS MASONRY ACCESSORIES

A. Compressible Filler: Pre-molded filler strips complying with ASTM D 1056, Grade 2A1; compressible up to 35 percent; of width and thickness indicated; formulated from neoprene or PVC.

B. Bond-Breaker Strips: Asphalt-saturated, organic roofing felt complying with ASTM D 226, Type I (No. 15 asphalt felt).

C. Weep/Vent Products: Use the following unless otherwise indicated:
   1. Cellular Plastic Weep/Vent: One-piece, flexible extrusion made from UV-resistant polypropylene copolymer, full height and width of head joint and depth 1/8 inch (3 mm) less than depth of outer wythe, in color selected from manufacturer's standard.

      a. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

         1) Advanced Building Products Inc.; Mortar Maze weep vent.
         2) Blok-Lok Limited; Cell-Vent.
         3) Dayton Superior Corporation, Dur-O-Wal Division; Cell Vents.
         4) Heckmann Building Products Inc.; No. 85 Cell Vent.
         5) Hohmann & Barnard, Inc.; Quadro-Vent.
         6) Wire-Bond; Cell Vent..

D. Cavity Drainage Material: Free-draining mesh, made from polymer strands that will not degrade within the wall cavity.

   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 Building Products Inc.
      b. Archovations, Inc.; CavClear Masonry Mat.
      c. Dayton Superior Corporation, Dur-O-Wal Division; Polytite MortarStop.
      d. Mortar Net USA, Ltd.; Mortar Net.

2. Provide one of the following configurations:

   a. Strips, full-depth of cavity and 10 inches (250 mm) high, with dovetail shaped notches 7 inches (175 mm) deep that prevent clogging with mortar droppings.
   b. Strips, not less than **1-1/2 inches (38 mm)** thick and 10 inches (250 mm) high, with dimpled surface designed to catch mortar droppings and prevent weep holes from clogging with mortar.

2.10 MASONRY CLEANERS

A. Proprietary Acidic Cleaner: Manufacturer's standard-strength cleaner designed for removing mortar/grout stains, efflorescence, and other new construction stains from new masonry without discoloring or damaging masonry surfaces. Use product expressly approved for intended use by cleaner manufacturer and manufacturer of masonry units being cleaned.

1. 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. Diedrich Technologies, Inc.
   b. EaCo Chem, Inc.
   c. ProSoCo, Inc.

2.11 MORTAR MIXES

A. General: Do not use admixtures, including pigments, air-entraining agents, accelerators, retarders, water-repellent agents, antifreeze compounds, or other admixtures unless otherwise indicated.

1. Do not use calcium chloride in mortar.
2. Use Portland cement-lime mortar unless otherwise indicated.
3. Add cold-weather admixture (if used) at same rate for all mortar that will be exposed to view, regardless of weather conditions, to ensure that mortar color is consistent.

B. Pre-blended, Dry Mortar Mix: Furnish dry mortar ingredients in form of a pre-blended mix. Measure quantities by weight to ensure accurate proportions, and thoroughly blend ingredients before delivering to Project site.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL

A. Leave openings for equipment to be installed before completing masonry. After installing equipment, complete masonry to match the construction immediately adjacent to opening.

B. Use full-size units without cutting if possible. If cutting is required to provide a continuous pattern or to fit adjoining construction, cut units with motor-driven saws; provide clean, sharp, unchipped edges. Allow units to dry before laying unless wetting of units is specified. Install cut units with cut surfaces and, where possible, cut edges concealed.

C. Select and arrange units for exposed unit masonry to produce a uniform blend of colors and textures.

1. Mix units from several pallets or cubes as they are placed.

D. Wetting of Brick: Wet brick before laying if initial rate of absorption exceeds 30 g/30 sq. in. (30 g/194 sq. cm) per minute when tested per ASTM C 67. Allow units to absorb water so they are damp but not wet at time of laying.

3.3 TOLERANCES

A. Dimensions and Locations of Elements:

1. For dimensions in cross section or elevation do not vary by more than plus 1/2 inch (12 mm) or minus 1/4 inch (6 mm).
2. For location of elements in plan do not vary from that indicated by more than plus or minus 1/2 inch (12 mm).
3. For location of elements in elevation do not vary from that indicated by more than plus or minus 1/4 inch (6 mm) in a story height or 1/2 inch (12 mm) total.

B. Lines and Levels:

1. For bed joints and top surfaces of bearing walls do not vary from level by more than 1/4 inch in 10 feet (6 mm in 3 m), or 1/2 inch (12 mm) maximum.
2. For conspicuous horizontal lines, such as lintels, sills, parapets, and reveals, do not vary from level by more than 1/8 inch in 10 feet (3 mm in 3 m), 1/4 inch in 20 feet (6 mm in 6 m), or 1/2 inch (12 mm) maximum.
3. For vertical lines and surfaces do not vary from plumb by more than 1/4 inch in 10 feet (6 mm in 3 m), 3/8 inch in 20 feet (9 mm in 6 m), or 1/2 inch (12 mm) maximum.
4. For conspicuous vertical lines, such as external corners, door jambs, reveals, and expansion and control joints, do not vary from plumb by more than 1/8 inch in 10 feet (3 mm in 3 m), 1/4 inch in 20 feet (6 mm in 6 m), or 1/2 inch (12 mm) maximum.
5. For lines and surfaces do not vary from straight by more than 1/4 inch in 10 feet (6 mm in 3 m), 3/8 inch in 20 feet (9 mm in 6 m), or 1/2 inch (12 mm) maximum.
6. For vertical alignment of exposed head joints, do not vary from plumb by more than 1/4 inch in 10 feet (6 mm in 3 m), or 1/2 inch (12 mm) maximum.

7. For faces of adjacent exposed masonry units, do not vary from flush alignment by more than 1/16 inch (1.5 mm) except due to warpage of masonry units within tolerances specified for warpage of units.

C. Joints:

1. For bed joints, do not vary from thickness indicated by more than plus or minus 1/8 inch (3 mm), with a maximum thickness limited to 1/2 inch (12 mm); do not vary from bed-joint thickness of adjacent courses by more than 1/8 inch (3 mm).
2. For exposed head joints, do not vary from thickness indicated by more than plus or minus 1/8 inch (3 mm).
3. For exposed bed joints and head joints of stacked bond, do not vary from a straight line by more than 1/16 inch (1.5 mm) from one masonry unit to the next.

3.4 LAYING MASONRY WALLS

A. Lay out walls in advance for accurate spacing of surface bond patterns with uniform joint thicknesses and for accurate location of openings, movement-type joints, returns, and offsets. Avoid using less-than-half-size units, particularly at corners, jambs, and, where possible, at other locations.

B. Bond Pattern for Exposed Masonry: Unless otherwise indicated, lay exposed masonry in one-third running bond and / or as shown on Drawings; do not use units with less than nominal 4-inch (100-mm) horizontal face dimensions at corners or jambs.

C. Stopping and Resuming Work: Stop work by racking back units in each course from those in course below; do not tooth. When resuming work, clean masonry surfaces that are to receive mortar, remove loose masonry units and mortar, and wet brick if required before laying fresh masonry.

D. Built-in Work: As construction progresses, build in items specified in this and other Sections. Fill in solidly with masonry around built-in items.

E. Fill space between steel frames and masonry solidly with mortar unless otherwise indicated.

3.5 MORTAR BEDDING AND JOINTING

A. Lay hollow brick as follows:

1. With face shells fully bedded in mortar and with head joints of depth equal to bed joints.
2. With entire units, including areas under cells, fully bedded in mortar at starting course on footings.

B. Lay solid masonry units with completely filled bed and head joints; butter ends with sufficient mortar to fill head joints and shove into place. Do not deeply furrow bed joints or slush head joints.

C. Tool exposed joints slightly concave when thumbprint hard, using a jointer larger than joint thickness unless otherwise indicated.

3.6 ANCHORING MASONRY VENEERS

A. Anchor masonry veneers to metal stud wall framing with masonry-veneer anchors to comply with the following requirements:

1. Fasten screw-attached and anchors through air / moisture barrier and sheathing to wall framing with metal fasteners of type indicated. Use two fasteners unless anchor design only uses one fastener.
2. Embed tie sections, connector sections and continuous wire in masonry joints. Provide not less than 1 inch (25 mm) of air space between back of masonry veneer and face of sheathing.
3. Locate anchor sections to allow maximum vertical differential movement of ties up and down.
4. Space anchors as indicated, but not more than 16 inches (406 mm) o.c. vertically and **24 inches (610 mm)** o.c. horizontally with not less than 1 anchor for each **2.67 sq. ft. (0.25 sq. m)** of wall area. Install additional anchors within 12 inches (305 mm) of openings and at intervals, not exceeding 36 inches (914 mm), around perimeter.
5. Thoroughly seal all penetrations through air/moisture barrier. Perform water spray tests on areas where anchors have been installed to insure wall is waterproof. Do not install foam insulation or masonry until it has been confirmed that wall substrates are waterproof.
6. Inlay insulation boards snugly between the legs of the uniform horizontal lines of the masonry anchors. Fill in open gaps of insulation greater than 1/8-inch wide.

3.7 EXPANSION JOINTS

A. General: Install expansion joint materials in unit masonry as masonry progresses. Do not allow materials to span expansion joints without provision to allow for in-plane wall or partition movement.

B. Form expansion joints in brick as follows:

1. Seal joints below grade and at junctures with horizontal expansion joints if any.
2. Build in compressible joint fillers where indicated.
3. Form open joint full depth of brick wythe and of width indicated, but not less than **3/8 inch (10 mm)** for installation of sealant and backer rod specified in Division 07 Section "Joint Sealants."

C. Provide horizontal, pressure-relieving joints by either leaving an air space or inserting a compressible filler of width required for installing sealant and backer rod specified in Division 07 Section "Joint Sealants," but not less than **3/8 inch (10 mm)**.

1. Locate horizontal, pressure-relieving joints beneath shelf angles supporting masonry.

3.8 LINTELS AND SHELF ANGLES

A. Install steel lintels where indicated. Provide continuous shelf angles at each floor level.

B. Provide minimum bearing of 8 inches (200 mm) at each jamb unless otherwise indicated.

3.9 FLASHING, WEEP HOLES, CAVITY DRAINAGE, AND VENTS

A. General: Install embedded flashing and weep holes in masonry at shelf angles, lintels, ledges, other obstructions to downward flow of water in wall, and where indicated. Install vents at shelf angles, ledges, and other obstructions to upward flow of air in cavities, and where indicated. Inspect all substrates prior to beginning work. Insure that all penetrations have been sealed, all window and door perimeters have been flashed and are completely waterproof before beginning work.

B. Install flashing as follows unless otherwise indicated:

1. Prepare masonry surfaces so they are smooth and free from projections that could puncture flashing. Where flashing is within mortar joint, place through-wall flashing on sloping bed of mortar and cover with mortar. Before covering with mortar, seal penetrations in flashing with adhesive, sealant, or tape as recommended by flashing manufacturer.
2. At masonry-veneer walls, extend flashing through veneer, across air space behind veneer, and up face of sheathing at least 8 inches (200 mm); with upper edge tucked under building paper or building wrap (air barrier system), lapping at least 4 inches (100 mm).
3. At lintels and shelf angles, extend flashing a minimum of 6 inches (150 mm) into masonry at each end. At heads and sills, extend flashing 6 inches (150 mm) at ends and turn up not less than 2 inches (50 mm) to form end dams.
4. Install metal drip edges integrated with through wall membrane flashings.
5. Install metal drip edges beneath flexible flashing at exterior face of wall. Stop flexible flashing 1/2 inch (13 mm) back from outside face of wall and adhere flexible flashing to top of metal drip edge.

C. Install reglets and nailers for flashing and other related construction where they are shown to be built into masonry.

D. Install weep holes in head joints in exterior wythes of first course of masonry immediately above embedded flashing and as follows:

1. Use specified weep/vent products to form weep holes.
2. Space weep holes 24 inches (600 mm) o.c. unless otherwise indicated.
3. Space weep holes formed from plastic tubing 16 inches (400 mm) o.c.
4. Trim wicking material flush with outside face of wall after mortar has set.

E. Place cavity drainage material in cavities to comply with configuration requirements for cavity drainage material in "Miscellaneous Masonry Accessories" Article.

F. Install vents in head joints in exterior wythes at spacing indicated. Use specified weep/vent products to form vents.

1. Close cavities off vertically and horizontally with blocking in manner indicated. Install through-wall flashing and weep holes above horizontal blocking.

3.10 FIELD QUALITY CONTROL

A. Testing and Inspecting: Contractor will engage special inspectors to perform tests and inspections and prepare reports. Allow inspectors access to scaffolding and work areas, as needed to perform tests and inspections. Retesting of materials that fail to meet specified requirements shall be done at Contractor's expense.

B. Inspections: Level 1 special inspections according to the "International Building Code."

1. Begin masonry construction only after inspectors have verified proportions of site-prepared mortar. Contractor to schedule and pay for inspections. Include inspections from 3rd party inspection in bid price.

C. Mortar Aggregate Ratio Test (Proportion Specification): For each mix provided, according to ASTM C 780.

3.11 REPAIRING, POINTING, AND CLEANING

A. Remove and replace masonry units that are loose, chipped, broken, stained, or otherwise damaged or that do not match adjoining units. Install new units to match adjoining units; install in fresh mortar, pointed to eliminate evidence of replacement.

B. Pointing: During the tooling of joints, enlarge voids and holes, except weep holes, and completely fill with mortar. Point up joints, including corners, openings, and adjacent construction, to provide a neat, uniform appearance. Prepare joints for sealant application, where indicated.

C. In-Progress Cleaning: Clean unit masonry as work progresses by dry brushing to remove mortar fins and smears before tooling joints.

D. Final Cleaning: After mortar is thoroughly set and cured, clean exposed masonry as follows:

1. Remove large mortar particles by hand with wooden paddles and nonmetallic scrape hoes or chisels.
2. Test cleaning methods on sample wall panel; leave one-half of panel uncleaned for comparison purposes. Obtain Architect's approval of sample cleaning before proceeding with cleaning of masonry.
3. Protect adjacent stone and non-masonry surfaces from contact with cleaner by covering them with liquid strippable masking agent or polyethylene film and waterproof masking tape.

4. Wet wall surfaces with water before applying cleaners; remove cleaners promptly by rinsing surfaces thoroughly with clear water.
5. Clean brick by bucket-and-brush hand-cleaning method described in "BIA Technical Notes 20."
6. Clean masonry with a proprietary acidic cleaner applied according to manufacturer's written instructions.
7. Clean concrete masonry by cleaning method indicated in NCMA TEK 8-2A applicable to type of stain on exposed surfaces.
8. Clean stone trim to comply with stone supplier's written instructions.
9. Clean limestone units to comply with recommendations in ILI's "Indiana Limestone Handbook."

3.12 MASONRY WASTE DISPOSAL

A. Salvageable Materials: Unless otherwise indicated, excess masonry materials are Contractor's property. At completion of unit masonry work, remove from Project site.

B. Excess Masonry Waste: Remove excess clean masonry waste that cannot be used as fill, as described above, and other masonry waste, and legally dispose of off Owner's property.

END OF SECTION 042113

SECTION 042200 - CONCRETE UNIT MASONRY

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:

1. Concrete masonry units.
2. Mortar and grout.
3. Steel reinforcing bars.
4. Masonry-joint reinforcement.
5. Embedded flashing.
6. Miscellaneous masonry accessories.

B. Related Requirements:

1. Section 033000 "Cast-In-Place Concrete" for slab-on-grade.
2. Section 042113 “Brick Masonry” for Ventilation Blocks and Glass Blocks.
3. Section 076200 "Sheet Metal Flashing and Trim" for exposed sheet metal flashing and for furnishing manufactured reglets installed in masonry joints.

1.3 DEFINITIONS

A. CMU(s): Concrete masonry unit(s).

B. Reinforced Masonry: Masonry containing reinforcing steel in grouted cells.

1.4 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at **Project site**.

1.5 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: For the following:

1. Masonry Units: Show sizes, profiles, coursing, and locations of special shapes.

2. Reinforcing Steel: Detail bending, lap lengths, and placement of unit masonry reinforcing bars. Comply with ACI 315. Show elevations of reinforced walls.
3. Fabricated Flashing: Detail corner units, end-dam units, and other special applications.

C. Samples for Initial Selection:
1. Weep holes/vents.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For testing agency.

B. Material Certificates: For each type and size of the following:

1. Masonry units.

a. Include data on material properties.
b. For masonry units used in structural masonry, include data and calculations establishing average net-area compressive strength of units.

2. Integral water repellant used in CMUs.
3. Cementitious materials. Include name of manufacturer, brand name, and type.
4. Mortar admixtures.
5. Preblended, dry mortar mixes. Include description of type and proportions of ingredients.
6. Grout mixes. Include description of type and proportions of ingredients.
7. Reinforcing bars.
8. Joint reinforcement.
9. Anchors, ties, and metal accessories.

C. Mix Designs: For each type of mortar and grout. Include description of type and proportions of ingredients.

1. Include test reports for mortar mixes required to comply with property specification. Test according to ASTM C109/C109M for compressive strength, ASTM C1506 for water retention, and ASTM C91/C91M for air content.
2. Include test reports, according to ASTM C1019, for grout mixes required to comply with compressive strength requirement.

D. Statement of Compressive Strength of Masonry: For each combination of masonry unit type and mortar type, provide statement of average net-area compressive strength of masonry units, mortar type, and resulting net-area compressive strength of masonry determined according to TMS 602/ACI 530.1/ASCE 6.

E. Cold-Weather and Hot-Weather Procedures: Detailed description of methods, materials, and equipment to be used to comply with requirements.

1.7 QUALITY ASSURANCE

Testing Agency Qualifications: Qualified according to ASTM C1093 for testing indicated.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Store masonry units on elevated platforms in a dry location. If units are not stored in an enclosed location, cover tops and sides of stacks with waterproof sheeting, securely tied. If units become wet, do not install until they are dry.

B. Store cementitious materials on elevated platforms, under cover, and in a dry location. Do not use cementitious materials that have become damp.

C. Store aggregates where grading and other required characteristics can be maintained and contamination avoided.

D. Deliver preblended, dry mortar mix in moisture-resistant containers. Store preblended, dry mortar mix in delivery containers on elevated platforms in a dry location or in covered weatherproof dispensing silos.

E. Store masonry accessories, including metal items, to prevent corrosion and accumulation of dirt and oil.

1.9 FIELD CONDITIONS

A. Protection of Masonry: During construction, cover tops of walls, projections, and sills with waterproof sheeting at end of each day's work. Cover partially completed masonry when construction is not in progress.

1. Extend cover a minimum of 24 inches down both sides of walls, and hold cover securely in place.

B. Do not apply uniform floor or roof loads for at least 12 hours and concentrated loads for at least three days after building masonry walls or columns.

C. Stain Prevention: Prevent grout, mortar, and soil from staining the face of masonry to be left exposed or painted. Immediately remove grout, mortar, and soil that come in contact with such masonry.

1. Protect base of walls from rain-splashed mud and from mortar splatter by spreading coverings on ground and over wall surface.
2. Protect sills, ledges, and projections from mortar droppings.
3. Protect surfaces of window and door frames, as well as similar products with painted and integral finishes, from mortar droppings.

4. Turn scaffold boards near the wall on edge at the end of each day to prevent rain from splashing mortar and dirt onto completed masonry.

D. Cold-Weather Requirements: Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen substrates. Remove and replace unit masonry damaged by frost or by freezing conditions. Comply with cold-weather construction requirements contained in TMS 602/ACI 530.1/ASCE 6.

1. Cold-Weather Cleaning: Use liquid cleaning methods only when air temperature is 40 deg F and higher and will remain so until masonry has dried, but not less than seven days after completing cleaning.

E. Hot-Weather Requirements: Comply with hot-weather construction requirements contained in TMS 602/ACI 530.1/ASCE 6.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Source Limitations for Masonry Units: Obtain exposed masonry units of a uniform texture and color, or a uniform blend within the ranges accepted for these characteristics, from single source from single manufacturer for each product required.

B. Source Limitations for Mortar Materials: Obtain mortar ingredients of a uniform quality, including color for exposed masonry, from single manufacturer for each cementitious component and from single source or producer for each aggregate.

2.2 PERFORMANCE REQUIREMENTS

A. Provide **structural** unit masonry that develops indicated net-area compressive strengths at 28 days.

1. Determine net-area compressive strength of masonry from average net-area compressive strengths of masonry units and mortar types (unit-strength method) according to TMS 602/ACI 530.1/ASCE 6.
2. Determine net-area compressive strength of masonry by testing masonry prisms according to ASTM C1314.

2.3 UNIT MASONRY, GENERAL

A. Masonry Standard: Comply with TMS 602/ACI 530.1/ASCE 6 except as modified by requirements in the Contract Documents.

B. Defective Units: Referenced masonry unit standards may allow a certain percentage of units to contain chips, cracks, or other defects exceeding limits stated. Do not use units where such

defects are exposed in the completed Work[**and will be within 20 feet vertically and horizontally of a walking surface**].

C. Fire-Resistance Ratings: Comply with requirements for fire-resistance-rated assembly designs indicated.

1. Where fire-resistance-rated construction is indicated, units shall be listed and labeled by a qualified testing agency acceptable to authorities having jurisdiction.

2.4 CONCRETE MASONRY UNITS

A. Shapes: Provide shapes indicated and as follows, with exposed surfaces matching exposed faces of adjacent units unless otherwise indicated.

1. Provide special shapes for lintels, corners, jambs, sashes, movement joints, headers, bonding, and other special conditions.
2. Provide **square-edged** units for outside corners unless otherwise indicated.

B. Integral Water Repellent: Provide units made with integral water repellent.

1. Integral Water Repellent: Liquid polymeric, integral water-repellent admixture that does not reduce flexural bond strength. Units made with integral water repellent, when tested according to ASTM E514/E514M as a wall assembly made with mortar containing integral water-repellent manufacturer's mortar additive, with test period extended to 24 hours, shall show no visible water or leaks on the back of test specimen.

C. CMUs: ASTM C90.

1. Unit Compressive Strength: Provide units with minimum average net-area compressive strength of [**2800 psi**]
2. Density Classification: **Normal weight**.
3. Size (Width): Manufactured to dimensions 3/8 inch less-than-nominal dimensions.
4. Exposed Faces: Provide color and texture matching the range represented by Architect's sample.
5. Faces to Receive Plaster: Where units are indicated to receive a direct application of plaster, provide textured-face units made with gap-graded aggregates.

2.5 CONCRETE AND MASONRY LINTELS

A. General: Provide one of the following:

B. Concrete Lintels: ASTM C1623, matching CMUs in color, texture, and density classification; and with reinforcing bars indicated. Provide lintels with net-area compressive strength not less than that of CMUs.

C. Concrete Lintels: Precast or formed-in-place concrete lintels complying with requirements in Section 032000 "Concrete Reinforcing," and with reinforcing bars indicated.

D. Masonry Lintels: Prefabricated or built-in-place masonry lintels made from bond beam CMUs matching adjacent CMUs in color, texture, and density classification, with reinforcing bars placed as indicated and filled with coarse grout. Cure precast lintels before handling and installing. Temporarily support built-in-place lintels until cured.

2.6 MORTAR AND GROUT MATERIALS

A. Portland Cement: ASTM C150/C150M, Type I or II, except Type III may be used for cold-weather construction. Provide natural color or white cement as required to produce mortar color indicated.

1. Alkali content shall not be more than 0.1 percent when tested according to ASTM C114.

B. Hydrated Lime: ASTM C207, Type S.

C. Portland Cement-Lime Mix: Packaged blend of portland cement and hydrated lime containing no other ingredients.

1. Mortar Pigments: Natural and synthetic iron oxides and chromium oxides, compounded for use in mortar mixes and complying with ASTM C979/C979M. Use only pigments with a record of satisfactory performance in masonry mortar.

D. Aggregate for Mortar: ASTM C144.

1. For mortar that is exposed to view, use washed aggregate consisting of natural sand or crushed stone.
2. For joints less than 1/4 inch (6 mm) thick, use aggregate graded with 100 percent passing the No. 16 (1.18-mm) sieve.
3. White-Mortar Aggregates: Natural white sand or crushed white stone.
4. Colored-Mortar Aggregates: Natural sand or crushed stone of color necessary to produce required mortar color.

E. Aggregate for Grout: ASTM C404.

F. Cold-Weather Admixture: Nonchloride, noncorrosive, accelerating admixture complying with ASTM C494/C494M, Type C, and recommended by manufacturer for use in masonry mortar of composition indicated.

G. Water-Repellent Admixture: Liquid water-repellent mortar admixture intended for use with CMUs containing integral water repellent from same manufacturer.

H. Water: Potable.

2.7 REINFORCEMENT

A. Uncoated Steel Reinforcing Bars: ASTM A615/A615M or ASTM A996/A996M, Grade 60.

B. Reinforcing Bar Positioners: Wire units designed to fit into mortar bed joints spanning masonry unit cells and to hold reinforcing bars in center of cells. Units are formed from 0.148-inch steel wire, hot-dip galvanized after fabrication. Provide units designed for number of bars indicated.

C. Masonry-Joint Reinforcement, General: Ladder type complying with ASTM A951/A951M.

1. Interior Walls: **Hot-dip** galvanized carbon steel.
2. Exterior Walls: **Hot-dip galvanized carbon** steel.
3. Wire Size for Side Rods: [**0.187-inch** diameter.
4. Wire Size for Cross Rods: [**0.148-inch** diameter.
5. Spacing of Cross Rods: Not more than 16 inches o.c.
6. Provide in lengths of not less than 10 feet **, with prefabricated corner and tee units**.

2.8 TIES AND ANCHORS

A. General: Ties and anchors shall extend at least 1-1/2 inches into masonry but with at least a 5/8-inch cover on outside face.

B. Materials: Provide ties and anchors specified in this article that are made from materials that comply with the following unless otherwise indicated:
1. Hot-Dip Galvanized, Carbon-Steel Wire: ASTM A82/A82M, with ASTM A153/A153M, Class B-2 coating.
2. Galvanized-Steel Sheet: ASTM A653/A653M, Commercial Steel, G60 zinc coating.
3. Steel Sheet, Galvanized after Fabrication: ASTM A1008/A1008M, Commercial Steel, with ASTM A153/A153M, Class B coating.

C. Adjustable Anchors for Connecting to Structural Steel Framing: Provide anchors that allow vertical or horizontal adjustment but resist tension and compression forces perpendicular to plane of wall.

1. Anchor Section for Welding to Steel Frame: Crimped 1/4-inch- diameter, **hot-dip galvanized steel.**
2. Tie Section: Triangular-shaped wire tie made from [**0.187-inch-**] diameter, **hot-dip galvanized steel** wire.

D. Adjustable Anchors for Connecting to Concrete: Provide anchors that allow vertical or horizontal adjustment but resist tension and compression forces perpendicular to plane of wall.

1. Connector Section: Dovetail tabs for inserting into dovetail slots in concrete and attached to tie section; formed from [**0.105-inch- thick steel sheet, galvanized after fabrication**]

   a. [**0.108-inch-**] thick, galvanized-steel sheet may be used at interior walls unless otherwise indicated.

2. Tie Section: Triangular-shaped wire tie made from [**0.187-inch-**

E. Partition Top Anchors: 0.105-inch- thick metal plate with a 3/8-inch- diameter metal rod 6 inches long welded to plate and with closed-end plastic tube fitted over rod that allows rod to move in and out of tube. Fabricate from [**hot-dip galvanized after fabrication**]

F. Rigid Anchors: Fabricate from steel bars [**1-1/2 inches wide by 1/4 inch thick by 24 inches (610 mm) long, with ends turned up 2 inches or with cross pins unless otherwise indicated**]

1. Corrosion Protection: [**Hot-dip galvanized to comply with ASTMA 153/A153M**]

2.9 EMBEDDED FLASHING MATERIALS

A. Metal Flashing: Provide metal flashing complying with SMACNA's "Architectural Sheet Metal Manual" and as follows:

1. Stainless Steel: ASTM A240/A240M or ASTM A666, Type 304, 0.016 inch (0.40 mm) thick.
2. Fabricate continuous flashings in sections 96 inches (2400 mm) long minimum, but not exceeding 12 feet (3.7 m). Provide splice plates at joints of formed, smooth metal flashing.
3. Fabricate through-wall metal flashing embedded in masonry from [**stainless steel**], with ribs at 3-inch (76-mm) intervals along length of flashing to provide an integral mortar bond.

4. Fabricate through-wall flashing with snaplock receiver on exterior face where indicated to receive counterflashing.
5. Fabricate through-wall flashing with drip edge **unless otherwise** indicated. Fabricate by extending flashing 1/2 inch (13 mm) out from wall, with outer edge bent down 30 degrees[**and hemmed**].
6. Fabricate through-wall flashing with sealant stop [**where**] [**unless otherwise**] indicated. Fabricate by bending metal back on itself 3/4 inch (19 mm) at exterior face of wall and down into joint 1/4 inch (6 mm) to form a stop for retaining sealant backer rod.
7. Fabricate metal [**drip edges**] [**and**] [**sealant stops**] for ribbed metal flashing from plain metal flashing of same metal as ribbed flashing and extending at least 3 inches (76 mm) into wall with hemmed inner edge to receive ribbed flashing and form a hooked seam. Form hem on upper surface of metal so that completed seam sheds water.
8. Fabricate metal drip edges from stainless steel. Extend at least 3 inches (76 mm) into wall and 1/2 inch (13 mm) out from wall, with outer edge bent down 30 degrees[**and hemmed**].
9. Fabricate metal sealant stops from stainless steel. Extend at least 3 inches (76 mm) into wall and out to exterior face of wall. At exterior face of wall, bend metal back on itself for 3/4 inch (19 mm) and down into joint 1/4 inch (6 mm) to form a stop for retaining sealant backer rod.
10. Fabricate metal expansion-joint strips from [**stainless steel** to shapes indicated.
11. Solder metal items at corners.

B. Flexible Flashing: Use the following unless otherwise indicated:

1. Rubberized-Asphalt Flashing: Composite flashing product consisting of a pliable, adhesive rubberized-asphalt compound, bonded to a high-density, cross-laminated polyethylene film to produce an overall thickness of not less than [**0.040 inch (1.02 mm)**].

C. Application: Unless otherwise indicated, use the following:

1. Where flashing is indicated to receive counterflashing, use metal flashing.
2. Where flashing is indicated to be turned down at or beyond the wall face, use metal flashing.
3. Where flashing is partly exposed and is indicated to terminate at the wall face, use metal flashing **with a drip edge**].
4. Where flashing is fully concealed, use [**metal flashing and flexible flashing**.

D. Solder and Sealants for Sheet Metal Flashings:[**As specified in Section 076200 "Sheet Metal Flashing and Trim."**]

1. Solder for Stainless Steel: ASTM B32, [**Grade Sn60**] [**Grade Sn96**], with acid flux of type recommended by stainless steel sheet manufacturer.
2. Elastomeric Sealant: ASTM C920, chemically curing [**silicone**] sealant; of type, grade, class, and use classifications required to seal joints in sheet metal flashing and remain watertight.

E. Adhesives, Primers, and Seam Tapes for Flashings: Flashing manufacturer's standard products or products recommended by flashing manufacturer for bonding flashing sheets to each other and to substrates.

2.10 MISCELLANEOUS MASONRY ACCESSORIES

A. Compressible Filler: Premolded filler strips complying with ASTM D1056, Grade 2A1; compressible up to 35 percent; of width and thickness indicated; formulated from [**neoprene**.

B. Preformed Control-Joint Gaskets: Made from **PVC, complying with ASTM D2287, Type PVC-65406**] and designed to fit standard sash block and to maintain lateral stability in masonry wall; size and configuration as indicated.

C. Bond-Breaker Strips: Asphalt-saturated felt complying with ASTM D226/D226M, Type I (No. 15 asphalt felt).

2.11 MORTAR AND GROUT MIXES

A. General: Do not use admixtures, including pigments, air-entraining agents, accelerators, retarders, water-repellent agents, antifreeze compounds, or other admixtures unless otherwise indicated.

1. Do not use calcium chloride in mortar or grout.
2. Use [**portland cement-lime**] mortar unless otherwise indicated.
3. Add cold-weather admixture (if used) at same rate for all mortar that will be exposed to view, regardless of weather conditions, to ensure that mortar color is consistent.

B. Mortar for Unit Masonry: Comply with ASTM C270, [**Proportion**] Specification. Provide the following types of mortar for applications stated unless another type is indicated[**or needed to provide required compressive strength of masonry**].
1. For reinforced masonry, use [**Type S**]
2. For mortar parge coats, use [**Type S**]

3. For exterior, above-grade, load-bearing and nonload-bearing walls and parapet walls; for interior load-bearing walls; for interior nonload-bearing partitions; and for other applications where another type is not indicated, use Type N.

C. Grout for Unit Masonry: Comply with ASTM C476.

1. Use grout of type indicated or, if not otherwise indicated, of type (fine or coarse) that will comply with TMS 602/ACI 530.1/ASCE 6 for dimensions of grout spaces and pour height.
2. Proportion grout in accordance with ASTM C476, [**Table 1**] [**or**] [**paragraph 4.2.2 for specified 28-day compressive strength indicated, but not less than 2000 psi (14 MPa)**].
3. Provide grout with a slump of [**8 to 11 inches (200 to 280 mm)**] [**10 to 11 inches (250 to 280 mm)**] as measured according to ASTM C143/C143M.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

1. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.
2. Verify that foundations are within tolerances specified.
3. Verify that reinforcing dowels are properly placed.
4. Verify that substrates are free of substances that would impair mortar bond.

B. Before installation, examine rough-in and built-in construction for piping systems to verify actual locations of piping.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL

A. Build chases and recesses to accommodate items specified in this and other Sections.

B. Leave openings for equipment to be installed before completing masonry. After installing equipment, complete masonry to match construction immediately adjacent to opening.

C. Use full-size units without cutting if possible. If cutting is required to provide a continuous pattern or to fit adjoining construction, cut units with motor-driven saws; provide clean, sharp, unchipped edges. Allow units to dry before laying unless wetting of units is specified. Install cut units with cut surfaces and, where possible, cut edges concealed.

3.3 TOLERANCES

A. Dimensions and Locations of Elements:

1. For dimensions in cross section or elevation, do not vary by more than plus 1/2 inch or minus 1/4 inch
2. For location of elements in plan, do not vary from that indicated by more than plus or minus 1/2 inch.
3. For location of elements in elevation, do not vary from that indicated by more than plus or minus 1/4 inch in a story height or 1/2 inch total.

B. Lines and Levels:

1. For bed joints and top surfaces of bearing walls, do not vary from level by more than 1/4 inch in 10 feet, or 1/2-inch maximum.
2. For conspicuous horizontal lines, such as lintels, sills, parapets, and reveals, do not vary from level by more than 1/8 inch in 10 feet, 1/4 inch in 20 feet, or 1/2-inch maximum.
3. For vertical lines and surfaces do not vary from plumb by more than 1/4 inch in 10 feet, 3/8 inch in 20 feet, or 1/2-inch maximum.
4. For conspicuous vertical lines, such as external corners, door jambs, reveals, and expansion and control joints, do not vary from plumb by more than 1/8 inch in 10 feet, 1/4 inch in 20 feet, or 1/2-inch maximum.
5. For lines and surfaces, do not vary from straight by more than 1/4 inch in 10 feet, 3/8 inch in 20 feet, or 1/2-inch maximum.
6. For vertical alignment of exposed head joints, do not vary from plumb by more than 1/4 inch in 10 feet, or 1/2-inch maximum.
7. For faces of adjacent exposed masonry units, do not vary from flush alignment by more than 1/16 inch.

C. Joints:

1. For bed joints, do not vary from thickness indicated by more than plus or minus 1/8 inch , with a maximum thickness limited to 1/2 inch.
2. For exposed bed joints, do not vary from bed-joint thickness of adjacent courses by more than 1/8 inch.
3. For head and collar joints, do not vary from thickness indicated by more than plus 3/8 inch or minus 1/4 inch.
4. For exposed head joints, do not vary from thickness indicated by more than plus or minus 1/8 inch.

3.4 LAYING MASONRY WALLS

A. Lay out walls in advance for accurate spacing of surface bond patterns with uniform joint thicknesses and for accurate location of openings, movement-type joints, returns, and offsets. Avoid using less-than-half-size units, particularly at corners, jambs, and, where possible, at other locations.

B. Bond Pattern for Exposed Masonry: Unless otherwise indicated, lay exposed masonry in [**running bond**]; do not use units with less-than-nominal 4-inch horizontal face dimensions at corners or jambs.

C. Lay concealed masonry with all units in a wythe in running bond or bonded by lapping not less than [**4 inches**]. Bond and interlock each course of each wythe at corners. Do not use units with less-than-nominal 4-inch horizontal face dimensions at corners or jambs.

D. Stopping and Resuming Work: Stop work by stepping back units in each course from those in course below; do not tooth. When resuming work, clean masonry surfaces that are to receive mortar, remove loose masonry units and mortar, and wet brick if required before laying fresh masonry.

E. Built-in Work: As construction progresses, build in items specified in this and other Sections. Fill in solidly with masonry around built-in items.

F. Fill space between steel frames and masonry solidly with mortar unless otherwise indicated.

G. Where built-in items are to be embedded in cores of hollow masonry units, place a layer of metal lath, wire mesh, or plastic mesh in the joint below, and rod mortar or grout into core.

H. Fill cores in hollow CMUs with grout 24 inches under bearing plates, beams, lintels, posts, and similar items unless otherwise indicated.

I. Build nonload-bearing interior partitions full height of story to underside of solid floor or roof structure above unless otherwise indicated.

1. Install compressible filler in joint between top of partition and underside of structure above.
2. Fasten partition top anchors to structure above and build into top of partition. Grout cells of CMUs solidly around plastic tubes of anchors and push tubes down into grout to provide 1/2-inch clearance between end of anchor rod and end of tube. Space anchors [**48 inches**] o.c. unless otherwise indicated.
3. Wedge nonload-bearing partitions against structure above with small pieces of tile, slate, or metal. Fill joint with mortar after dead-load deflection of structure above approaches final position.
4. At fire-rated partitions, treat joint between top of partition and underside of structure above to comply with Section 078443 "Joint Firestopping."

3.5 MORTAR BEDDING AND JOINTING

A. Lay hollow CMUs as follows:

1. Bed face shells in mortar and make head joints of depth equal to bed joints.
2. Bed webs in mortar in all courses of piers, columns, and pilasters.
3. Bed webs in mortar in grouted masonry, including starting course on footings.
4. Fully bed entire units, including areas under cells, at starting course on footings where cells are not grouted.

B. Lay solid CMUs with completely filled bed and head joints; butter ends with sufficient mortar to fill head joints and shove into place. Do not deeply furrow bed joints or slush head joints.

C. Set cast-stone trim units in full bed of mortar with full vertical joints. Fill dowel, anchor, and similar holes.

1. Clean soiled surfaces with fiber brush and soap powder and rinse thoroughly with clear water.
2. Wet joint surfaces thoroughly before applying mortar.
3. Rake out mortar joints for pointing with sealant.

D. Rake out mortar joints at pre-faced CMUs to a uniform depth of 1/4 inch and point with epoxy mortar to comply with epoxy-mortar manufacturer's written instructions.

E. Tool exposed joints slightly concave when thumbprint hard, using a jointer larger than joint thickness unless otherwise indicated.

F. Cut joints flush for masonry walls to receive plaster or other direct-applied finishes (other than paint) unless otherwise indicated.

G. Cut joints flush where indicated to receive waterproofing unless otherwise indicated.

3.6 MASONRY-JOINT REINFORCEMENT

A. General: Install entire length of longitudinal side rods in mortar with a minimum cover of 5/8 inch on exterior side of walls, 1/2 inch elsewhere. Lap reinforcement a minimum of 6 inches .

1. Space reinforcement not more than 16 inches o.c.
2. Space reinforcement not more than 8 inches o.c. in foundation walls and parapet walls.
3. Provide reinforcement not more than 8 inches above and below wall openings and extending 12 inches beyond openings[**in addition to continuous reinforcement**].

B. Interrupt joint reinforcement at control and expansion joints unless otherwise indicated.

C. Provide continuity at wall intersections by using prefabricated T-shaped units.

D. Provide continuity at corners by using prefabricated L-shaped units.

E. Cut and bend reinforcing units as directed by manufacturer for continuity at[**corners,**] returns, offsets, column fireproofing, pipe enclosures, and other special conditions.

3.7 ANCHORING MASONRY TO STRUCTURAL STEEL AND CONCRETE

A. Anchor masonry to structural steel and concrete, where masonry abuts or faces structural steel or concrete, to comply with the following:

1. Provide an open space not less than [**1 inch**] wide between masonry and structural steel or concrete unless otherwise indicated. Keep open space free of mortar and other rigid materials.
2. Anchor masonry with anchors embedded in masonry joints and attached to structure.
3. Space anchors as indicated, but not more than 24 inches o.c. vertically and 36 inches o.c. horizontally.

3.8 CONTROL AND EXPANSION JOINTS

A. General: Install control- and expansion-joint materials in unit masonry as masonry progresses. Do not allow materials to span control and expansion joints without provision to allow for in-plane wall or partition movement.

B. Form control joints in concrete masonry:
1. Install temporary foam-plastic filler in head joints, and remove filler when unit masonry is complete for application of sealant.

3.9 LINTELS

A. Provide [**masonry**] lintels where shown and where openings of more than 12 inches for brick-size units and 24 inches for block-size units are shown without structural steel or other supporting lintels.

B. Provide minimum bearing of 8 inches at each jamb unless otherwise indicated.

3.10 FLASHING

A. General: Install embedded flashing at ledges and other obstructions to downward flow of water in wall where indicated.

B. Install flashing as follows unless otherwise indicated:

1. Prepare masonry surfaces so they are smooth and free from projections that could puncture flashing. Where flashing is within mortar joint, place through-wall flashing on sloping bed of mortar and cover with mortar. Before covering with mortar, seal penetrations in flashing with adhesive, sealant, or tape[**as recommended by flashing manufacturer**].
2. At lintels, extend flashing a minimum of 6 inches (150 mm) into masonry at each end. At heads and sills, extend flashing 6 inches (150 mm) at ends and turn up not less than 2 inches (50 mm) to form end dams.
3. Interlock end joints of ribbed sheet metal flashing by overlapping ribs not less than 1-1/2 inches (38 mm) or as recommended by flashing manufacturer, and seal lap with elastomeric sealant complying with requirements in Section 079200 "Joint Sealants" for application indicated.
4. Install metal [**drip edges**] with ribbed sheet metal flashing by interlocking hemmed edges to form hooked seam. Seal seam with elastomeric sealant complying with requirements in Section 079200 "Joint Sealants" for application indicated.

5. Install metal drip edges beneath flexible flashing at exterior face of wall. Stop flexible flashing 1/2 inch (13 mm) back from outside face of wall, and adhere flexible flashing to top of metal drip edge.
6. Install metal flashing termination beneath flexible flashing at exterior face of wall. Stop flexible flashing 1/2 inch (13 mm) back from outside face of wall, and adhere flexible flashing to top of metal flashing termination.
7. Cut flexible flashing off flush with face of wall after masonry wall construction is completed.

C. Install single-wythe CMU flashing system in bed joints of CMU walls where indicated to comply with manufacturer's written instructions. Install CMU cell pans with upturned edges located below face shells and webs of CMUs above and with weep spouts aligned with face of wall. Install CMU web covers so that they cover upturned edges of CMU cell pans at CMU webs and extend from face shell to face shell.

D. Install reglets and nailers for flashing and other related construction where they are shown to be built into masonry.

3.11 REINFORCED UNIT MASONRY

A. Temporary Formwork and Shores: Construct formwork and shores as needed to support reinforced masonry elements during construction.

1. Construct formwork to provide shape, line, and dimensions of completed masonry as indicated. Make forms sufficiently tight to prevent leakage of mortar and grout. Brace, tie, and support forms to maintain position and shape during construction and curing of reinforced masonry.
2. Do not remove forms and shores until reinforced masonry members have hardened sufficiently to carry their own weight and other loads that may be placed on them during construction.

B. Placing Reinforcement: Comply with requirements in TMS 602/ACI 530.1/ASCE 6.

C. Grouting: Do not place grout until entire height of masonry to be grouted has attained enough strength to resist grout pressure.

1. Comply with requirements in TMS 602/ACI 530.1/ASCE 6 for cleanouts and for grout placement, including minimum grout space and maximum pour height.
2. Limit height of vertical grout pours to not more than [**60 inches**

3.12 FIELD QUALITY CONTROL

A. Testing and Inspecting: Owner will engage special inspectors to perform tests and inspections and prepare reports. Allow inspectors access to scaffolding and work areas as needed to perform tests and inspections. Retesting of materials that fail to comply with specified requirements shall be done at Contractor's expense.

B. Inspections: Special inspections according to Level [**B**] in TMS 402/ACI 530/ASCE 5.

1. Begin masonry construction only after inspectors have verified proportions of site-prepared mortar.
2. Place grout only after inspectors have verified compliance of grout spaces and of grades, sizes, and locations of reinforcement.
3. Place grout only after inspectors have verified proportions of site-prepared grout.

C. Testing Prior to Construction: One set of tests.

D. Testing Frequency: One set of tests for each 5000 sq. ft. of wall area or portion thereof.

E. Concrete Masonry Unit Test: For each type of unit provided, according to ASTM C140 for compressive strength.

F. Mortar Aggregate Ratio Test (Proportion Specification): For each mix provided, according to ASTM C780.

G. Mortar Test (Property Specification): For each mix provided, according to ASTM C780. Test mortar for [**mortar air content**] [**and**] [**compressive strength**].

H. Prism Test: For each type of construction provided, according to ASTM C1314 at [**7 days and at**]28 days.

3.13 REPAIRING, POINTING, AND CLEANING

A. Remove and replace masonry units that are loose, chipped, broken, stained, or otherwise damaged or that do not match adjoining units. Install new units to match adjoining units; install in fresh mortar, pointed to eliminate evidence of replacement.

B. Pointing: During the tooling of joints, enlarge voids and holes, except weep holes, and completely fill with mortar. Point up joints, including corners, openings, and adjacent construction, to provide a neat, uniform appearance. Prepare joints for sealant application, where indicated.

C. In-Progress Cleaning: Clean unit masonry as work progresses by dry brushing to remove mortar fins and smears before tooling joints.

D. Final Cleaning: After mortar is thoroughly set and cured, clean exposed masonry as follows:

1. Remove large mortar particles by hand with wooden paddles and nonmetallic scrape hoes or chisels.
2. Test cleaning methods on sample wall panel; leave one-half of panel uncleaned for comparison purposes. Obtain Architect's approval of sample cleaning before proceeding with cleaning of masonry.
3. Protect adjacent stone and nonmasonry surfaces from contact with cleaner by covering them with liquid strippable masking agent or polyethylene film and waterproof masking tape.
4. Wet wall surfaces with water before applying cleaners; remove cleaners promptly by rinsing surfaces thoroughly with clear water.
5. Clean concrete masonry by applicable cleaning methods indicated in NCMA TEK 8-4A.

3.14 MASONRY WASTE DISPOSAL

A. Salvageable Materials: Unless otherwise indicated, excess masonry materials are Contractor's property. At completion of unit masonry work, remove from Project site.

B. Waste Disposal as Fill Material: Dispose of clean masonry waste, including excess or soil-contaminated sand, waste mortar, and broken masonry units, by crushing and mixing with fill material as fill is placed.

1. Crush masonry waste to less than 4 inches in each dimension.
2. Mix masonry waste with at least two parts of specified fill material for each part of masonry waste. Fill material is specified in Section 312000 "Earth Moving."
3. Do not dispose of masonry waste as fill within 18 inches of finished grade.

C. Masonry Waste Recycling: Return broken CMUs not used as fill to manufacturer for recycling.

D. Excess Masonry Waste: Remove excess clean masonry waste that cannot be used as fill, as described above or recycled, and other masonry waste, and legally dispose of off Owner's property.

END OF SECTION 042200

SECTION 061000 - ROUGH CARPENTRY

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:

1. Framing with dimension lumber.
2. Framing with engineered wood products.
3. Rooftop equipment bases and support curbs.
4. Wood blocking, cants, and nailers.
5. Wood furring and grounds.
6. Wood sleepers.
7. Exterior plywood decking below metal roof.
8. Formwork.
9. Blocking for other trades.
10. Grounds, bucks, screens, ladders, runways, walls, etc.
11. Supply and installations of rough hardware.
12. Wood furring, blocking, shims, and hanging strips for installing woodwork items that are not concealed within other construction.
13. Reference Structural Drawings.

B. Related Requirements:
1. Division 07 Section "Sheet Metal Roofing”

1.3 DEFINITIONS

A. Exposed Framing: Framing not concealed by other construction.

B. Dimension Lumber: Lumber of 2 inches nominal (38 mm actual) or greater but less than 5 inches nominal (114 mm actual) in least dimension.

C. Timber: Lumber of 5 inches nominal (114 mm actual) or greater in least dimension.

1.4

A. Lumber grading agencies, and the abbreviations used to reference them, include the following:

1. NeLMA: Northeastern Lumber Manufacturers' Association.
2. NLGA: National Lumber Grades Authority.

3. RIS: Redwood Inspection Service.
4. SPIB: The Southern Pine Inspection Bureau.
5. WCLIB: West Coast Lumber Inspection Bureau.
6. WWPA: Western Wood Products Association.

1.5 ACTION SUBMITTALS

A. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.

1. Include data for wood-preservative treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Indicate type of preservative used and net amount of preservative retained.
2. Include data for fire-retardant treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Include physical properties of treated materials based on testing by a qualified independent testing agency.
3. For fire-retardant treatments, include physical properties of treated lumber both before and after exposure to elevated temperatures, based on testing by a qualified independent testing agency according to ASTM D 5664.
4. For products receiving a waterborne treatment, include statement that moisture content of treated materials was reduced to levels specified before shipment to Project site.
5. Include copies of warranties from chemical treatment manufacturers for each type of treatment.
6. Wood blocking shall be engineered to withstand the uplift forces, as required per the ANSI-SPRI ES-1 and FM 1-49 tested coping / edge assembly.

B. Fastener Patterns: Full-size templates for fasteners in exposed framing.

C. Sustainable Submittals:

1. Product Certificates: For products and materials required to comply with requirements for regional materials indicating location and distance from Project of material manufacturer and point of extraction, harvest, or recovery for each raw material.

2. Alternate: Chain-of-custody certificates certifying that products specified to be made from certified wood comply with forest certification requirements. Include evidence that mill is certified for chain of custody by an FSC-accredited certification body. Include statement indicating cost for each certified wood product.

3. Product Data: For composite wood products, documentation indicating that the bonding agent contains no urea formaldehyde.

1.6 INFORMATIONAL SUBMITTALS

A. Material Certificates: For dimension lumber specified to comply with minimum allowable unit stresses. Indicate species and grade selected for each use and design values approved by the ALSC Board of Review.

B. Evaluation Reports: For the following, from ICC-ES:

1. Wood-preservative-treated wood.
2. Fire-retardant-treated wood.
3. Engineered wood products.
4. Shear panels.
5. Power-driven fasteners.
6. Powder-actuated fasteners.
7. Expansion anchors.
8. Metal framing anchors.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Stack lumber flat with spacers beneath and between each bundle to provide air circulation. Protect lumber from weather by covering with waterproof sheeting, securely anchored. Provide for air circulation around stacks and under coverings.

PART 2 - PRODUCTS

2.1 WOOD PRODUCTS, GENERAL

A. Certified Wood: Materials shall be produced from wood obtained from forests certified by an FSC-accredited certification body to comply with FSC STD-01-001, "FSC Principles and Criteria for Forest Stewardship for the following:

1. Dimension lumber framing.
2. Timber.
3. Laminated-veneer lumber.
4. Parallel-strand lumber.
5. Prefabricated wood I-joists.
6. Rim boards.
7. Miscellaneous lumber.

B. Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, provide lumber that complies with the applicable rules of any rules-writing agency certified by the ALSC Board of Review. Provide lumber graded by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated.

1. Factory mark each piece of lumber with grade stamp of grading agency.

2. For exposed lumber indicated to receive a stained or natural finish, mark grade stamp on end or back of each piece or omit grade stamp and provide certificates of grade compliance issued by grading agency.

3. Where nominal sizes are indicated, provide actual sizes required by DOC PS 20 for moisture content specified. Where actual sizes are indicated, they are minimum dressed sizes for dry lumber.

4. Provide dressed lumber, S4S, unless otherwise indicated.

C. Maximum Moisture Content of Lumber: 15 percent unless otherwise indicated.

D. Engineered Wood Products: Provide engineered wood products acceptable to authorities having jurisdiction and for which current model code research or evaluation reports exist that show compliance with building code in effect for Project.

1. Allowable Design Stresses: Provide engineered wood products with allowable design stresses, as published by manufacturer that meet or exceed those indicated. Manufacturer's published values shall be determined from empirical data or by rational engineering analysis and demonstrated by comprehensive testing performed by a qualified independent testing agency.

2.2 WOOD-PRESERVATIVE-TREATED LUMBER

A. Preservative Treatment by Pressure Process: AWPA U1; Use Category UC2 for interior construction not in contact with the ground, Use Category UC3b for exterior construction not in contact with the ground, and Use Category UC4a for items in contact with the ground.

1. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium.
2. For exposed items indicated to receive a stained or natural finish, use chemical formulations that do not require incising, contain colorants, bleed through, or otherwise adversely affect finishes.

B. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Do not use material that is warped or that does not comply with requirements for untreated material.

C. Mark lumber with treatment quality mark of an inspection agency approved by the ALSC Board of Review.

1. For exposed lumber indicated to receive a stained or natural finish, mark end or back of each piece or omit marking and provide certificates of treatment compliance issued by inspection agency.

D. Application: Treat items indicated on Drawings, and the following:

1. Wood cants, nailers, curbs, equipment support bases, blocking, stripping, and similar members in connection with roofing, flashing, vapor barriers, and waterproofing.
2. Wood sills, sleepers, blocking, furring, stripping, and similar concealed members in contact with masonry or concrete.
3. Wood framing and furring attached directly to the interior of below-grade exterior masonry or concrete walls.

4. Wood framing members that are less than 18 inches (460 mm) above the ground in crawlspaces or unexcavated areas.
5. Wood floor plates that are installed over concrete slabs-on-grade.

2.3 FIRE-RETARDANT-TREATED MATERIALS

A. General: Where fire-retardant-treated materials are indicated, use materials complying with requirements in this article that are acceptable to authorities having jurisdiction, and with fire-test-response characteristics specified.

B. Fire-Retardant-Treated Lumber and Plywood by Pressure Process: Products with a flame spread index of 25 or less when tested according to ASTM E 84, and with no evidence of significant progressive combustion when the test is extended an additional 20 minutes, and with the flame front not extending more than 10.5 feet (3.2 m) beyond the centerline of the burners at any time during the test.

1. Use treatment that does not promote corrosion of metal fasteners.
2. Exterior Type: Treated materials shall comply with requirements specified above for fire-retardant-treated lumber and plywood by pressure process after being subjected to accelerated weathering according to ASTM D 2898. Use for exterior locations and where indicated.
3. Interior Type A: Treated materials shall have a moisture content of 28 percent or less when tested according to ASTM D 3201 at 92 percent relative humidity. Use where exterior type is not indicated.

C. Kiln-dry plywood after treatment to a maximum moisture content of 15 percent.

D. Identify fire-retardant-treated wood with appropriate classification marking of qualified testing agency.

1. For exposed lumber indicated to receive a stained or natural finish, mark end or back of each piece or omit marking and provide certificates of treatment compliance issued by testing agency.

E. For exposed items indicated to receive a stained or natural finish, use chemical formulations that do not bleed through, contain colorants, or otherwise adversely affect finishes.

F. Application: Treat items indicated on Drawings, and the following:

1. Framing for raised platforms.
2. Framing for stages.
3. Concealed blocking.
4. Framing for non-load-bearing partitions.
5. Framing for non-load-bearing exterior walls.
6. Roof construction.
7. Plywood backing panels.

2.4 ENGINEERED WOOD PRODUCTS

A. Laminated-Veneer Lumber: Structural composite lumber made from wood veneers with grain primarily parallel to member lengths, evaluated and monitored according to ASTM D 5456 and manufactured with an exterior-type adhesive complying with ASTM D 2559.

B. Parallel-Strand Lumber: Structural composite lumber made from wood strand elements with grain primarily parallel to member lengths, evaluated and monitored according to ASTM D 5456 and manufactured with an exterior-type adhesive complying with ASTM D 2559.

2.5 MISCELLANEOUS LUMBER

A. General: Provide miscellaneous lumber indicated and lumber for support or attachment of other construction, including the following:

1. Blocking.
2. Nailers.
3. Rooftop equipment bases and support curbs.
4. Cants (only at modified bitumen roofing if used).
5. Furring.
6. Grounds.
7. Utility shelving.

B. For items of dimension lumber size, provide Construction or No. 2 grade lumber and any of the following species:

1. Hem-fir (north); NLGA.
2. Mixed southern pine; SPIB.
3. Spruce-pine-fir; NLGA.
4. Hem-fir; WCLIB or WWPA.
5. Spruce-pine-fir (south); NeLMA, WCLIB, or WWPA.
6. Western woods; WCLIB or WWPA.
7. Northern species; NLGA.
8. Eastern softwoods; NeLMA.

C. For utility shelving, provide lumber with 15 percent maximum moisture content and any of the following species and grades:

1. Eastern white pine, Idaho white, lodgepole, ponderosa, or sugar pine; Premium or No. 2 Common (Sterling) grade; NeLMA, NLGA, WCLIB, or WWPA.
2. Mixed southern pine; No. 1 grade; SPIB.
3. Hem-fir or hem-fir (north); Select Merchantable or No. 1 Common grade; NLGA, WCLIB, or WWPA.
4. Spruce-pine-fir (south) or spruce-pine-fir; Select Merchantable or No. 1 Common grade; NeLMA, NLGA, WCLIB, or WWPA.

D. For concealed boards, provide lumber with 15 percent maximum moisture content and any of the following species and grades:

1. Mixed southern pine; No. 2 grade; SPIB.
2. Hem-fir or hem-fir (north); Construction or No. 2 Common grade; NLGA, WCLIB, or WWPA.
3. Spruce-pine-fir (south) or spruce-pine-fir; Construction or No. 2 Common grade; NeLMA, NLGA, WCLIB, or WWPA.
4. Eastern softwoods; No. 2 Common grade; NeLMA.
5. Northern species; No. 2 Common grade; NLGA.
6. Western woods; Construction or No. 2 Common grade; WCLIB or WWPA.

E. For blocking not used for attachment of other construction, Utility, Stud, or No. 3 grade lumber of any species may be used provided that it is cut and selected to eliminate defects that will interfere with its attachment and purpose.

F. For blocking and nailers used for attachment of other construction, select and cut lumber to eliminate knots and other defects that will interfere with attachment of other work.

G. For furring strips for installing plywood or hardboard paneling, select boards with no knots capable of producing bent-over nails and damage to paneling.

2.6 PLYWOOD BACKING PANELS

A. Equipment Backing Panels: DOC PS 1, Exterior, C-C Plugged, fire-retardant treated, in thickness indicated or, if not indicated, not less than 1/2-inch (13-mm) nominal thickness.

2.7 FASTENERS

A. General: Provide fasteners of size and type indicated that comply with requirements specified in this article for material and manufacture.

1. Where rough carpentry is exposed to weather, in ground contact, pressure-preservative treated, or in area of high relative humidity, provide fasteners of Type 304 stainless steel or hot dip galvanized.

B. Nails, Brads, and Staples: ASTM F 1667.

C. Power-Driven Fasteners: NES NER-272.

D. Wood Screws: ASME B18.6.1.

E. Lag Bolts: ASME B18.2.1 (ASME B18.2.3.8M).

F. Bolts: Steel bolts complying with ASTM A 307, Grade A (ASTM F 568M, Property Class 4.6); with ASTM A 563 (ASTM A 563M) hex nuts and, where indicated, flat washers.

G. Expansion Anchors: Anchor bolt and sleeve assembly of material indicated below with capability to sustain, without failure, a load equal to six times the load imposed when installed in unit masonry assemblies and equal to four times the load imposed when installed in concrete as determined by testing per ASTM E 488 conducted by a qualified independent testing and inspecting agency.

1. Material: Carbon-steel components, zinc plated to comply with ASTM B 633, Class Fe/Zn 5.
2. Material: Stainless steel with bolts and nuts complying with ASTM F 593 and ASTM F 594, Alloy Group 1 or 2 (ASTM F 738M and ASTM F 836M, Grade A1 or A4).

2.8 MISCELLANEOUS MATERIALS

A. Sill-Sealer Gaskets: Glass-fiber-resilient insulation, fabricated in strip form, for use as a sill sealer; 1-inch (25-mm) nominal thickness, compressible to 1/32 inch (0.8 mm); selected from manufacturer's standard widths to suit width of sill members indicated.

B. Sill-Sealer Gaskets: Closed-cell neoprene foam, 1/4 inch (6.4 mm) thick, selected from manufacturer's standard widths to suit width of sill members indicated.

C. Flexible Flashing: Composite, self-adhesive, flashing product consisting of a pliable, rubberized-asphalt compound, bonded to a high-density polyethylene film, aluminum foil, or spun-bonded polyolefin to produce an overall thickness of not less than 0.025 inch (0.6 mm).

D. Adhesives for Gluing Furring and Sleepers to Concrete or Masonry: Formulation complying with ASTM D 3498 that is approved for use indicated by adhesive manufacturer.

1. Adhesives shall have a VOC content of 70 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
2. Adhesives shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

E. Water-Repellent Preservative: NWWDA-tested and -accepted formulation containing 3-iodo-2-propynyl butyl carbamate, combined with an insecticide containing chloropyrifos as its active ingredient.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Set rough carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit rough carpentry to other construction; scribe and cope as needed for accurate fit. Locate furring, nailers, blocking, grounds, and similar supports to comply with requirements for attaching other construction.

B. Framing Standard: Comply with AF&PA's WCD 1, "Details for Conventional Wood Frame Construction," unless otherwise indicated.

C. Framing with Engineered Wood Products: Install engineered wood products to comply with manufacturer's written instructions.

D. Install plywood backing panels by fastening to studs; coordinate locations with utilities requiring backing panels. Install fire-retardant treated plywood backing panels with classification marking of testing agency exposed to view.

E. Shear Wall Panels: Install shear wall panels to comply with manufacturer's written instructions.

F. Metal Framing Anchors: Install metal framing anchors to comply with manufacturer's written instructions. Install fasteners through each fastener hole.

G. Install sill sealer gasket to form continuous seal between sill plates and foundation walls.

H. Do not splice structural members between supports unless otherwise indicated.

I. Provide blocking and framing as indicated and as required to support facing materials, fixtures, specialty items, and trim.

1. Provide metal clips for fastening gypsum board or lath at corners and intersections where framing or blocking does not provide a surface for fastening edges of panels. Space clips not more than 16 inches (406 mm) o.c.

J. Sort and select lumber so that natural characteristics will not interfere with installation or with fastening other materials to lumber. Do not use materials with defects that interfere with function of member or pieces that are too small to use with minimum number of joints or optimum joint arrangement.

K. Securely attach rough carpentry work to substrate by anchoring and fastening as indicated, complying with the following:

1. NES NER-272 for power-driven fasteners.
2. Table 2304.9.1, "Fastening Schedule," in ICC's International Building Code.

3. Table R602.3(1), "Fastener Schedule for Structural Members," and Table R602.3(2), "Alternate Attachments," in ICC's International Residential Code for One- and Two-Family Dwellings.

L. Use steel common nails or screws unless otherwise indicated. Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting wood. Drive nails snug but do not countersink nail heads unless otherwise indicated.

M. For exposed work, arrange fasteners in straight rows parallel with edges of members, with fasteners evenly spaced, and with adjacent rows staggered.

1. Comply with approved fastener patterns where applicable. Before fastening, mark fastener locations, using a template made of sheet metal, plastic, or cardboard.
2. Use finishing nails unless otherwise indicated. Countersink nail heads and fill holes with wood filler.
3. Use common nails or screws unless otherwise indicated. Drive nails snug but do not countersink nail heads.

3.2 WOOD GROUND, SLEEPER, BLOCKING, AND NAILER INSTALLATION

A. Install where indicated and where required for attaching other work. Form to shapes indicated and cut as required for true line and level of attached work. Coordinate locations with other work involved.

B. Attach items to substrates to support applied loading. Recess bolts and nuts flush with surfaces unless otherwise indicated.

C. Where wood-preservative-treated lumber is installed adjacent to metal decking, install continuous flexible flashing separator between wood and metal decking.

D. Provide permanent grounds of dressed, pressure-preservative-treated, key-beveled lumber not less than 1-1/2 inches (38 mm) wide and of thickness required to bring face of ground to exact thickness of finish material. Remove temporary grounds when no longer required.

3.3 WOOD FURRING INSTALLATION

A. Install level and plumb with closure strips at edges and openings. Shim with wood as required for tolerance of finish work.

B. Furring to Receive Plywood or Hardboard Paneling: Install 1-by-3-inch nominal- (19-by-63-mm actual-) size furring horizontally and vertically at 24 inches (610 mm) o.c.

C. Furring to Receive Gypsum Board: Install 1-by-2-inch nominal- (19-by-38-mm actual-) size furring vertically at 16 inches (406 mm) o.c.

3.4 PROTECTION

A. Protect wood that has been treated with inorganic boron (SBX) from weather. If, despite protection, inorganic boron-treated wood becomes wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.

B. Protect rough carpentry from weather. If, despite protection, rough carpentry becomes sufficiently wet that moisture content exceeds that specified, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.

END OF SECTION 061000

SECTION 071900 – CONCRETE FLOOR SEALER

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 penetrating, water-repellent sealer and concrete hardener for the following horizontal surfaces:

1. Cast-in-place concrete floors at exposed locations in the building.

B. Related Sections:

1. Division 03 Section "Cast-in-Place Concrete".

1.3 PERFORMANCE REQUIREMENTS

A. General Performance: Water repellents shall meet performance requirements indicated without failure due to defective manufacture, fabrication, or installation.

1.4 PRE-CONSTRUCTION TESTING

A. Pre-construction Testing: Installed water repellents shall comply with performance requirements indicated, as evidenced by reports based on Project-specific pre-construction testing of existing substrate assemblies by a qualified testing agency.

1. Select sizes and configurations of assemblies to adequately demonstrate capability of water repellents to comply with performance requirements.
2. In addition to verifying performance requirements, use test applications to verify manufacturer's written instructions for application procedure and optimum rates of product application to substrate assemblies.
3. Notify Architect seven days in advance of the dates and times when assemblies will be tested.

1.5 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

1. Include manufacturer's printed statement of VOC content.
2. Include manufacturer's standard colors.

3. Include manufacturer's recommended number of coats for each type of substrate and spreading rate for each separate coat.
4. Printout of current "MPI Approved Products List" for each product category specified in Part 2 that specify water repellents approved by MPI, with the proposed product highlighted.

B. Samples: For each type of water repellent and substrate indicated, 12 by 12 inches (300 by 300 mm) in size, with specified water-repellent treatment applied to half of each Sample.

C. Data:

1. Product Data: For paints and coatings, including printed statement of VOC content.

2. Laboratory Test Reports

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified Applicator.

B. Product Certificates: For each type of water repellent, from manufacturer.

C. Preconstruction Testing Reports: For water-repellent-treated substrates.

D. Field quality-control reports.

E. Warranty: Special warranty specified in this Section.

1.7 QUALITY ASSURANCE

A. Applicator Qualifications: An employer of workers trained and approved by manufacturer.

B. MPI Standards: Comply with MPI standards indicated and provide water repellents listed in its "MPI Approved Products List."

C. Pre-installation Conference: Conduct conference at Project site.

1.8 PROJECT CONDITIONS

A. Limitations: Proceed with application only when the following existing and forecasted weather and substrate conditions permit water repellents to be applied according to manufacturers' written instructions and warranty requirements:

1. Concrete surfaces and mortar have cured for not less than 28 days.
2. Building has been closed in for not less than 30 days before treating wall assemblies.
3. Ambient temperature is above 40 deg F (4.4 deg C) and below 100 deg F (37.8 deg C) and will remain so for 24 hours.
4. Substrate is not frozen and substrate-surface temperature is above 40 deg F (4.4 deg C) and below 100 deg F (37.8 deg C).

1.9 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer and Applicator agree(s) to repair or replace materials that fail to maintain water repellency specified in "Performance Requirements" Article within specified warranty period.

1. Warranty Period: Two years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PENETRATING WATER REPELLENTS

A. Product: “Consolideck LS Guard” as manufactured by ProSoCo or approved equal.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Applicator present, for compliance with requirements and conditions affecting performance of the Work.

1. Verify that surfaces are clean and dry according to water-repellent manufacturer's requirements. Check moisture content in three representative locations by method recommended by manufacturer.
2. Inspect for previously applied treatments that may inhibit penetration or performance of water repellents.
3. Verify that there is no efflorescence or other removable residues that would be trapped beneath the application of water repellent.
4. Verify that required repairs are complete, cured, and dry before applying water repellent.

B. Test pH level according to water-repellent manufacturer's written instructions to ensure chemical bond to silica-containing or siliceous minerals.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Cleaning: Before application of water repellent, clean substrate of substances that could impair penetration or performance of product according to water-repellent manufacturer's written instructions and as follows:

1. Cast-in-Place Concrete: Remove oil, curing compounds, laitance, and other substances that inhibit penetration or performance of water repellents.

B. Protect adjoining work, including mortar and sealant bond surfaces, from spillage or blow-over of water repellent. Cover adjoining and nearby surfaces of aluminum and glass if there is the possibility of water repellent being deposited on surfaces. Cover live vegetation.

C. Coordination with Mortar Joints: Do not apply water repellent until pointing mortar for joints adjacent to surfaces receiving water-repellent treatment has been installed and cured.

D. Coordination with Sealant Joints: Do not apply water repellent until sealants for joints adjacent to surfaces receiving water-repellent treatment have been installed and cured.

1. Water-repellent work may precede sealant application only if sealant adhesion and compatibility have been tested and verified using substrate, water repellent, and sealant materials identical to those required.

3.3 APPLICATION

A. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect the substrate before application of water repellent and to instruct Applicator on the product and application method to be used.

B. Apply a heavy-saturation coating of water repellent, on surfaces indicated for treatment, using 15 psi- (103 kPa-) pressure spray with a fan-type spray nozzle to the point of saturation. Apply coating in dual passes of uniform, overlapping strokes. Remove excess material; do not allow material to puddle beyond saturation. Comply with manufacturer's written instructions for application procedure unless otherwise indicated.

C. Apply a second saturation coating, repeating first application. Comply with manufacturer's written instructions for limitations on drying time between coats and after rainstorm wetting of surfaces between coats. Consult manufacturer's technical representative if written instructions are not applicable to Project conditions.

3.4 FIELD QUALITY CONTROL

A. Testing of Water-Repellent Material: Owner reserves the right to invoke the following procedure at any time and as often as Owner deems necessary during the period when water repellent is being applied:

1. Owner will engage the services of a qualified testing agency to sample water-repellent material being used. Samples of material delivered to Project site will be taken, identified, sealed, and certified in presence of Contractor.
2. Testing agency will perform tests for compliance of water-repellent material with product requirements.
3. Owner may direct Contractor to stop applying water repellents if test results show material being used does not comply with product requirements. Contractor shall remove

noncomplying material from Project site, pay for testing, and correct deficiency of surfaces treated with rejected materials, as approved by Architect.

B. Coverage Test: In the presence of Architect, hose down a dry, repellent-treated surface to verify complete and uniform product application. A change in surface color will indicate incomplete application.

1. Notify Architect seven days in advance of the dates and times when surfaces will be tested.
2. Reapply water repellent until coverage test indicates complete coverage.

3.5 CLEANING

A. Immediately clean water repellent from adjoining surfaces and surfaces soiled or damaged by water-repellent application as work progresses. Correct damage to work of other trades caused by water-repellent application, as approved by Architect.

B. Comply with manufacturer's written cleaning instructions.

END OF SECTION 071900

SECTION 07 21 00 - THERMAL INSULATION

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

A. Section Includes:
   1. Glass-fiber blanket insulation under roof deck.
   2. Foam plastic insulation board in roof sandwich panels.
   3. Reference Drawings for R-values.

B. Related Sections:
   1. Division 06 Section - Rough Carpentry.
   2. Division 07 Section – Sheet Metal Roofing.

1.03 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

1.04 INFORMATIONAL SUBMITTALS

A. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for each product.
B. Research/Evaluation Reports: For foam-plastic insulation, from ICC-ES.

1.05 QUALITY ASSURANCE

A. Surface-Burning Characteristics: As determined by testing identical products according to ASTM E 84 by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Protect insulation materials from physical damage and from deterioration due to moisture, soiling, and other sources. Store inside and in a dry location. Comply with manufacturer's written instructions for handling, storing, and protecting during installation.
B. Protect foam-plastic board insulation as follows:
   1. Do not expose to sunlight except to necessary extent for period of installation and concealment.

2. Protect against ignition at all times. Do not deliver foam-plastic board materials to Project site before installation time.
3. Quickly complete installation and concealment of foam-plastic board insulation in each area of construction.

PART 2 - PRODUCTS

2.01 GLASS-FIBER BLANKET INSULATION

A. 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. CertainTeed Corporation.
2. Guardian Building Products, Inc.
3. Johns Manville.
4. Owens Corning.

2.02 FOAM PLASTIC BOARD INSULATION

A. Extruded-Polystyrene Board Insulation: ASTM C 578, of type and minimum compressive strength indicated below, with maximum flame-spread and smoke-developed indexes of 75 and 450, respectively, per ASTM E 84.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. DiversiFoam Products.
b. Dow Chemical Company (The).
c. Sto Industries.

2. Type VI, 40 psi (276 kPa).

PART 3 - EXECUTION

3.01 PREPARATION

A. Clean substrates of substances that are harmful to insulation or that interfere with insulation attachment.

3.02 INSTALLATION, GENERAL

A. Comply with insulation manufacturer's written instructions applicable to products and applications indicated.
B. Install insulation that is undamaged, dry, and unsoiled and that has not been left exposed to ice, rain, or snow at any time.

C. Extend insulation to envelop entire area to be insulated. Cut and fit tightly around obstructions and fill voids with insulation. Remove projections that interfere with placement.

D. Provide sizes to fit applications indicated and selected from manufacturer's standard thicknesses, widths, and lengths. Apply single layer of insulation units to produce thickness indicated unless multiple layers are otherwise shown or required to make up total thickness.

3.03 INSTALLATION OF INSULATION FOR FRAMED CONSTRUCTION

A. Apply insulation units to substrates by method indicated, complying with manufacturer's written instructions. If no specific method is indicated, bond units to substrate with adhesive or use mechanical anchorage to provide permanent placement and support of units.

B. Foam-Plastic Board Insulation: Seal joints between units by applying adhesive, mastic, or sealant to edges of each unit to form a tight seal as units are shoved into place. Fill voids in completed installation with adhesive, mastic, or sealant as recommended by insulation manufacturer.

C. Glass-Fiber or Mineral-Wool Blanket Insulation: Install in cavities formed by framing members according to the following requirements:

1. Use insulation widths and lengths that fill the cavities formed by framing members. If more than one length is required to fill the cavities, provide lengths that will produce a snug fit between ends.
2. Place insulation in cavities formed by framing members to produce a friction fit between edges of insulation and adjoining framing members.
3. Maintain 3-inch (76-mm) clearance of insulation around recessed lighting fixtures not rated for or protected from contact with insulation.
4. Install eave ventilation troughs between roof framing members in insulated attic spaces at vented eaves.

3.04 PROTECTION

A. Protect installed insulation from damage due to harmful weather exposures, physical abuse, and other causes. Provide temporary coverings or enclosures where insulation is subject to abuse and cannot be concealed and protected by permanent construction immediately after installation.

END OF SECTION 07 21 00

SECTION 072600 – UNDER-SLAB VAPOR BARRIER\

PART 1 - GENERAL

1.1 SUMMARY

A. Products supplied under this section:
1. Vapor barrier, seam tape, and mastic for installation under concrete slabs on grade and at below grade slab areas at garage. Continue under and around elevator pits to provide waterproof construction.

B. Related sections:
1. Section 03 30 00 Cast-in-Place Concrete

1.2 REFERENCES

A. American Society for Testing and Materials (ASTM):
1. ASTM E 1745-09 Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill Under Concrete Slabs.
2. ASTM E 154-99 (2005) Standard Test Methods for Water Vapor Retarders Used in Contact with Earth Under Concrete Slabs, on Walls, or as Ground Cover.
3. ASTM E 96-05 Standard Test Methods for Water Vapor Transmission of Materials.
4. ASTM F 1249-06 Standard Test Method for Water Vapor Transmission Rate Through Plastic Film and Sheeting Using a Modulated Infrared Sensor.
5. ASTM E 1643-09 Selection, Design, Installation, and Inspection of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs.

B. American Concrete Institute (ACI):
1. ACI 302.2R-06 Guide for Concrete Slabs that Receive Moisture-Sensitive Flooring Materials.

1.3 SUBMITTALS

A. Quality control/assurance:
1. Manufacturer's samples, literature.
2. Manufacturer's installation instructions for placement, seaming and penetration repair instructions.

1.4 Pre-Installation Conference: Prior to commencement of field operations a pre-installation conference shall be held to establish procedures to maintain optimum working conditions and to coordinate this work with related and adjacent work.

PART 2 – PRODUCTS

2.1 MATERIALS

A. Vapor barrier must have all of the following qualities:
1. Permeance of less than 0.01 Perms [grains/(ft^2 · hr · inHg)] as tested in accordance with ASTM E 1745 Section 7.

2. Other performance criteria:
a. Strength: ASTM E 1745 Class A.
b. Thickness: 15 mils

B. Vapor barrier products:
1. Basis of Design: Stego Wrap Vapor Barrier (15-mil) by Stego Industries LLC, (877) 464-7834 www.stegoindustries.com or equal.

2.2 ACCESSORIES

A. Seam tape:
1. Stego Tape by Stego Industries LLC, (877) 464-7834 www.stegoindustries.com or equal.

B. Vapor-proofing mastic:
1. Stego Crete Tape by Stego Industries LLC, or equal.

PART 3 – EXECUTION

3.1 PREPARATION

A. Ensure that base material is approved by Architect or Geotechnical Engineer.
1. Level and compact base material.

3.2 INSTALLATION

A. Install vapor barrier in accordance with manufacturer's instructions and ASTM E 1643.
1. Unroll vapor barrier with the longest dimension parallel with the direction of the concrete placement.
2. Lap vapor barrier over footings and/or seal to foundation walls.
3. Overlap joints 6 inches and seal with manufacturer's tape.
4. Seal all penetrations (including pipes) per manufacturer's instructions.
5. No penetration of the vapor barrier is allowed except for reinforcing steel and permanent utilities.
6. Repair damaged areas by cutting patches of vapor barrier, overlapping damaged area 6 inches and taping all sides with tape.

END OF SECTION 072500

SECTION 07 27 29 –FLUID-APPLIED MEMBRANE AIR & MOISTURE BARRIER

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 application of a vapor-permeable, air and moisture barrier over all exterior wall substrates including all transitions and penetrations to bridge and seal all air leakage pathways and gaps. Install air barrier system over all gypsum sheathing substrate surfaces behind masonry veneer and composite metal panels. Include all interface flashings at intersections between exterior envelope systems as necessary to provide a waterproof assembly.

B. Related Requirements:
   1. Section 033000 – Cast-In-Place Concrete
   2. Section 042000 – Brick and Unit Masonry
   3. Section 076200 – Sheet Metal Flashing and Trim
   4. Section 084413 – Glazed Aluminum Curtain Walls

1.3 DEFINITIONS

A. Air-Barrier Material: A primary element that provides a continuous barrier to the movement of air.

B. Air-Barrier Accessory: A transitional component of the air barrier that provides continuity.

C. Air-Barrier Assembly: The collection of air-barrier materials and accessory materials applied to an opaque wall, including joints and junctions to abutting construction, to control air movement through the wall.

1.4 PRE-INSTALLATION MEETINGS

A. Pre-installation Conference: Conduct conference at Project site. All parties associated with air and moisture barrier along with adjacent materials shall be included.

   1. Review air-barrier requirements and installation, special details, mockups, air-leakage and bond testing, air-barrier protection, and work scheduling that covers air barriers.

1.5 ACTION SUBMITTALS

A. Product Data: For each type of product.

   1. Include manufacturer's written instructions for evaluating, preparing, and treating substrate; technical data; and tested physical and performance properties of products.

2. Submit test data by qualified testing agency indicating membrane air barrier meets performance requirements, when requested by Architect.

B. LEED Submittals:
1. Product Data for Credit IEQ 4.2: For air-barrier products, documentation including printed statement of VOC content.
2. Laboratory Test Reports for Credit IEQ 4: For air barriers, documentation indicating that products comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

C. Shop Drawings: For air-barrier assemblies.

1. Show locations and extent of air barrier. Include details for substrate joints and cracks, counterflashing strips, penetrations, inside and outside corners, terminations, flashing transition assemblies and tie-ins with adjoining construction.
2. Include details of interfaces with other materials that form part of air barrier.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer. Include list of installers and supervisors employed by the Installer, who work on Project.

B. Product Certificates: From air-barrier manufacturer, certifying compatibility of air barriers and accessory materials with Project materials that connect to or that come into contact with membrane air barriers.

C. Product Test Reports: For each air-barrier assembly, for tests performed by a qualified testing agency.

D. Low-Emitting Product Verification: Submit GREENGUARD Children & Schools certificate (verifiable at http://www.greenguard.org/en/SearchResults.aspx?BrandID=1001).

E. Fire Testing: From a qualified testing agency, documentation that the air barrier system as a component of a wall assembly has been tested and passed NFPA285. <Include UL Systems or other independent laboratory system classification number on shop drawings.>

1.7 QUALITY ASSURANCE

A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer, with a record of successful installations on projects of similar scope.

B. Installer shall be licensed by ABAA according to ABAA's Quality Assurance Program and shall employ ABAA-certified installers and supervisors on Project.

C. Air Barrier Inspector Qualifications: A technical representative of manufacturer not engaged in the sale of products and experienced in the installation and maintenance of the specified air barrier system, qualified to perform observation and inspection specified in Field Quality Control Article, to determine Installer’s compliance with the requirements of this Project, and

approved by the manufacturer to issue warranty certification. The Inspector shall be one of the following:

1. An authorized full-time technical employee of the manufacturer.

2. An independent party certified as an air barrier inspector by the ABAA or other certifying organization acceptable to Architect, retained by the Contractor.

D. Mockups: Build mockups to set quality standards for materials and execution.

1. Build integrated mockups of exterior wall assembly as specified in other Sections, incorporating backup wall construction, external cladding, window, storefront, door frame and sill, opening transition assembly, insulation, ties and other penetrations, and flashing to demonstrate surface preparation, crack and joint treatment, application of air barriers, and sealing of gaps, terminations, and penetrations of air-barrier assembly.

   a. Coordinate construction of mockups to permit inspection by Owner's testing agency of air barrier before external insulation and cladding are installed.
   b. Include junction with roofing membrane, building corner condition, and foundation wall intersection.
   c. If Architect determines mockups do not comply with requirements, reconstruct mockups and apply air barrier until mockups are approved.

2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.8 WARRANTY

A. Submit manufacturer's warranty that air barrier and accessories are free of defects at time of delivery and are manufactured to meet manufacturer's published physical properties and material specifications.

B. Manufacturer Material Warranty Period: Ten years from date of completion of the air barrier membrane installation.

C. Installer Labor and Material Warranty Period: Three years from date of completion of the air barrier membrane installation.

D. Inspection – Manufacturer Certified 3rd Party Inspector as required to obtain specified warranty.

1.9 PRE-CONSTRUCTION TESTING

A. Pre-construction Testing Service: Owner will engage a qualified testing agency to perform pre-construction testing on field mockups.

1.10 DELIVERY, STORAGE, AND HANDLING

A. Remove and replace liquid materials that cannot be applied within their stated shelf life.

B. Protect stored materials from direct sunlight.

1.11 COORDINATION

A. Coordinate installation of sheet metal and membrane air barrier with completion of roofing and other moisture protection work.

1.12 FIELD CONDITIONS

A. Environmental Limitations: Apply air barrier within the range of ambient and substrate temperatures recommended by air-barrier manufacturer.

1. Protect substrates from environmental conditions that affect air-barrier performance.
2. Do not apply air barrier to a damp or wet substrate or during snow, rain, fog, or mist.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

A. Source Limitations: Obtain primary air-barrier materials and air-barrier accessories from single source from single manufacturer.

B. VOC Content: Adhesives / sealants shall comply with VOC limits listed in Spec 018113.

C. Low-Emitting Materials: Air barriers shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

2.2 PERFORMANCE REQUIREMENTS

A. General: Air barrier shall be capable of performing as a continuous vapor- permeable air barrier and as a liquid-water drainage plane flashed to discharge to the exterior incidental condensation or water penetration. Air-barrier assemblies shall be capable of accommodating substrate movement and of sealing substrate expansion and control joints, construction material changes, penetrations, tie-ins to embedded flashing, tie-ins to installed waterproofing, and transitions at perimeter conditions without deterioration and air leakage exceeding specified limits.

B. Air-Barrier Assembly Air Leakage: Maximum 0.004 cfm/sq. ft. of surface area at 1.57 lbf/sq. ft. (0.2 L/s x sq. m of surface area at 75 Pa), when tested according to ASTM E 2357.

C. Fire Testing: Air barrier system as a component of a wall assembly shall have been tested and passed NFPA285.

D. Water Penetration: 15 lb./sq. ft. per ASTM E331.

2.3 SYNTHETIC VAPOR-PERMEABLE MEMBRANE AIR-BARRIER

A. Fluid-Applied, Vapor-Permeable Membrane Air Barrier: Elastomeric, modified bituminous or synthetic polymer membrane.

1. Products: Subject to compliance with requirements, provide one of the following:

a. Synthetic Polymer Membrane:

1) Tremco Incorporated, an RPM company; "ExoAir" (or approved equal): Openings, transitions and windows will either use 30 mil detail coat of ExoAir 230 with Tremco 2011 Mesh fully embedded into additional 30mil coat of ExoAir 230 (Tremco written approval of method must be submitted in writing) or ExoAir 110 self-adhered membrane flashing with sealed edges in accordance with Tremco recommendations and application. Thru-wall flashing membrane to be Tremco ExoAir TWF, self-adhered thru-wall flashing with stainless steel drip leg - to occur at all floor expansion joints, window heads, and masonry cavity terminations where drainage of cavity is to occur. Metal Flashing: stainless drip edges , opening perimeter stainless steel flashing at storefront and door frames, sill flashing at waterproofing transitions to openings at grade, balcony, and above grade terrace/deck openings. Apply membrane at a minimum rate of 70 wet mils; 35 dry mils.

2) Alternate manufacturers may be acceptable provided they meet or exceed performance of specified products. These include: Grace, Carlisle, Henry and/or Soprema (provided they can meet all specification requirements).

2. Physical and Performance Properties:

a. Air Permeance: Maximum 0.004 cfm/sq. ft. of surface area at 1.57-lbf/sq. ft. (0.02 L/s x sq. m of surface area at 75-Pa) pressure difference; ASTM E 2178.
b. Vapor Permeance: Minimum 10 perms (580 ng/Pa x s x sq. m); ASTM E 96/E 96M, Method B
c. Ultimate Elongation: Minimum 200 percent; ASTM D 412, Die C.
d. Combustion Characteristics: Flame spread, not greater than 25; smoke development, not greater than 450, ASTM E 84.
e. UV Resistance: minimum 150 daily cycles of UV and water spray with no visible deterioration in QUV-B Weathering Chamber.

2.4 ACCESSORY MATERIALS

A. General: Accessory materials recommended by air-barrier manufacturer to produce a complete air-barrier assembly and compatible with primary air-barrier material.

B. Primer: Liquid primer recommended for substrate by air-barrier material manufacturer. Adhesive shall meet VOC content complying with Section 018113.

C. Counterflashing Strip: Modified bituminous, 40-mil- (1.0-mm-) thick, self-adhering sheet consisting of 32 mils (0.8 mm) of rubberized asphalt laminated to an 8-mil- (0.2-mm-) thick,

D. cross-laminated polyethylene film with release liner backing, or aluminum foil bonded to composite membrane flashing at locations where silicone sealants will bond to membrane (window and door perimeters).

E. Modified Bituminous Strip: Vapor retarding, 40 mils (1.0 mm) thick, smooth surfaced, self-adhering; consisting of 36 mils (0.9 mm) of rubberized asphalt laminated to a 4-mil- (0.1-mm-) thick aluminum film with release liner backing.

F. Substrate-Patching Membrane: Manufacturer's standard trowel-grade substrate filler.

G. Adhesive and Tape: Air-barrier manufacturer's standard adhesive and pressure-sensitive adhesive tape. Adhesive shall meet VOC content complying with Section 018113.

H. Stainless-Steel Sheet: ASTM A 240/A 240M, Type 304, 0.0187 inch (0.5 mm) thick, and Series 300 stainless-steel fasteners.

I. Sprayed Polyurethane Foam Sealant: One- or two-component, foamed-in-place, polyurethane foam sealant, 1.5- to 2.0-lb/cu. ft (24- to 32-kg/cu. m) density; flame-spread index of 25 or less according to ASTM E 162; with primer and noncorrosive substrate cleaner recommended by foam sealant manufacturer. Adhesive shall meet VOC content complying with Section 018113.

J. Joint Sealant: ASTM C 920, single-component, neutral-curing silicone; Class 100/50 (low modulus), Grade NS, Use NT related to exposure, and, as applicable to joint substrates indicated, Use O, and approved by membrane air manufacturer for adhesion and compatibility with membrane air barrier and accessories. Comply with Division 07 Section "Joint Sealants." Adhesives / sealants shall comply with VOC limits listed in Spec 018113.

1. Basis of Design: Tremco, Inc., Spectrem 1.

K. Termination Mastic: Air-barrier manufacturer's standard cold fluid-applied elastomeric liquid; trowel grade. Adhesives / sealants shall comply with VOC limits listed in Spec 018113.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Back-laps within the air barrier assembly will not be considered an acceptable installation. The use of termination sealant / liquid membrane along the edges of the sheet membrane flashing with the subsequent weather / shingle-lapping of fluid-applied air barrier a minimum of 3” (or manufacturer min. dimension) will be required.

B. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements and other conditions affecting performance of the Work.

1. Verify that substrates are sound and free of oil, grease, dirt, excess mortar, or other contaminants.
2. Verify that concrete has cured and aged for minimum time period recommended by air-barrier manufacturer.
3. Verify that masonry joints are flush and completely filled with mortar.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 SURFACE PREPARATION

A. Clean, prepare, treat, and seal substrate according to manufacturer's written instructions. Provide clean, dust-free, and dry substrate for air-barrier application.

B. Mask off adjoining surfaces not covered by air barrier to prevent spillage and overspray affecting other construction.

C. Remove grease, oil, bitumen, form-release agents, paints, curing compounds, and other penetrating contaminants or film-forming coatings from concrete.

D. Remove fins, ridges, mortar, and other projections and fill honeycomb, aggregate pockets, holes, and other voids in concrete with substrate-patching membrane.

E. Remove excess mortar from masonry ties, shelf angles, and other obstructions.

F. At changes in substrate plane, apply sealant or termination mastic beads at sharp corners and edges to form a smooth transition from one plane to another.

G. Cover gaps in substrate plane and form a smooth transition from one substrate plane to another with stainless-steel sheet mechanically fastened to structural framing to provide continuous support for air barrier.

3.3 JOINT TREATMENT

A. Concrete and Masonry: Prepare, treat, rout, and fill joints and cracks in substrate according to ASTM C 1193 and air-barrier manufacturer's written instructions. Remove dust and dirt from joints and cracks complying with ASTM D 4258 before coating surfaces.

1. Prime substrate and apply a single thickness of air-barrier manufacturer's recommended preparation coat extending a minimum of 3 inches (75 mm) along each side of joints and cracks. Apply a double thickness of fluid air-barrier material and embed a joint reinforcing strip in preparation coat.

B. Gypsum Sheathing:
1. Fill joints greater than 1/4 inch (6 mm) and less than 1/2” with sealant according to ASTM C 1193 and air-barrier manufacturer's written instructions. Apply first layer of fluid air-barrier material at joints. Tape joints with joint reinforcing strip after first layer is dry. Apply a second layer of fluid air-barrier material over joint reinforcing strip.
2. For joints 1/2”(12 mm) or greater, apply transition strip over cured air-barrier material overlapping 3 inches (75 mm) onto each surface according to air-barrier manufacturer's written instructions

3.4 PRIMER

A. Apply primer to substrates at required rate and allow it to dry. Adhesive shall meet VOC content complying with Section 018113.

B. Limit priming to areas that will be covered by fluid air-barrier material on same day. Re-prime areas exposed for more than 24 hours.

C. Prime glass-fiber-surfaced gypsum sheathing with number of prime coats needed to achieve required bond, with adequate drying time between coats.

3.5 TRANSITION STRIP INSTALLATION

A. General: Install strips, transition strips, and accessory materials according to air-barrier manufacturer's written instructions to form a seal with adjacent construction and maintain a continuous air barrier.

1. Coordinate the installation of air barrier with installation of roofing membrane and base flashing to ensure continuity of air barrier with roofing membrane.
2. Continue TPO roof membrane up and over top of parapet and integrate with air barrier. Provide 3 inches (75 mm) of coverage over each substrate.

B. Connect and seal exterior wall air-barrier material continuously to roofing-membrane air barrier, concrete below-grade structures, floor-to-floor construction, exterior glazing and window systems, glazed curtain-wall systems, storefront systems, exterior louvers, exterior door framing, and other construction used in exterior wall openings, using accessory materials.

C. At end of each working day, seal top edge of strips and transition strips to substrate with termination mastic.

D. Apply joint sealants forming part of air-barrier assembly within manufacturer's recommended application temperature ranges. Consult manufacturer when sealant cannot be applied within these temperature ranges.

E. Wall Openings: Prime concealed perimeter frame surfaces of windows, curtain walls, storefronts, and doors. Apply opening transition assembly so that a minimum of 3 inches (75 mm) of coverage is achieved over each substrate. Maintain 3 inches (75 mm) of full contact over firm bearing to perimeter frames with not less than 1 inch (25 mm) of full contact.

1. Opening Transition Assembly: Refer to Division 08 Section "Opening Transition Assembly."

F. Fill gaps in perimeter frame surfaces of windows, curtain walls, storefronts, and doors, and miscellaneous penetrations of air-barrier material with foam sealant.

G. Seal strips and transition strips around masonry reinforcing or ties and penetrations with termination mastic.

H. Seal top of through-wall flashings to air barrier with an additional 6-inch- (150-mm-) wide, modified bituminous strip at nonmetallic flashings or counterflashing strip at metal flashings.

I. Seal exposed edges of strips at seams, cuts, penetrations, and terminations not concealed by metal counter-flashings or ending in reglets with termination mastic.

J. Repair punctures, voids, and deficient lapped seams in strips and transition strips. Slit and flatten fishmouths and blisters. Patch with transition strips extending 6 inches (150 mm) beyond repaired areas in strip direction.

3.6 FLUID AIR-BARRIER MEMBRANE INSTALLATION

A. General: Apply fluid air-barrier material to form a seal with strips and transition strips and to achieve a continuous air barrier according to air-barrier manufacturer's written instructions. Apply fluid air-barrier material within manufacturer's recommended application temperature ranges. Apply membrane at a minimum rate of 70 wet mils. Seal all penetrations to ensure waterproof and air tight construction.

1. Apply primer to substrates at required rate and allow it to dry.
2. Limit priming to areas that will be covered by fluid air-barrier material on same day. Re-prime areas exposed for more than 24 hours.
3. Prime glass-fiber-surfaced gypsum sheathing with number of prime coats needed to achieve required bond, with adequate drying time between coats.

B. Membrane Air Barriers: Apply a continuous unbroken air-barrier membrane to substrates according to the following thickness. Apply air-barrier membrane in full contact around protrusions such as masonry ties.
1. Vapor-Permeable Membrane Air Barrier: Total dry film thickness per manufacturer’s written installation instructions, applied in one or more equal coats.

C. Apply transition strip a minimum of 6 inches (150 mm) onto cured air-barrier material or overlapping 3 inches (75 mm) onto each surface according to air-barrier manufacturer's written instructions.

D. Do not cover air barrier until it has been tested and inspected by Owner's testing agency.

E. Correct deficiencies in or remove air barrier that does not comply with requirements; repair substrates and reapply air-barrier components.

3.7 FIELD QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.

B. Inspections: Air-barrier materials, accessories, and installation are subject to inspection for compliance with requirements. Inspections may include the following:

1. Contractor shall provide a wet-mil thickness log during installation to verify wet-mil thickness testing and an adequate thickness is being applied. A minimum of 10 dry mil tests within the first 1000 sqft installed shall be included, and 1 test per 1000 sqft thereafter.

2. Continuity of air-barrier system has been achieved throughout the building envelope with no gaps or holes.
3. Continuous structural support of air-barrier system has been provided.

4. Masonry and concrete surfaces are smooth, clean, and free of cavities, protrusions, and mortar droppings.
5. Site conditions for application temperature and dryness of substrates have been maintained.
6. Maximum exposure time of materials to UV deterioration has not been exceeded.
7. Surfaces have been primed, if applicable.
8. Laps in strips and transition strips have complied with minimum requirements and have been shingled in the correct direction (or mastic has been applied on exposed edges), with no fishmouths.
9. Termination mastic has been applied on cut edges.
10. Strips and transition strips have been firmly adhered to substrate.
11. Compatible materials have been used.
12. Transitions at changes in direction and structural support at gaps have been provided.
13. Connections between assemblies (air-barrier and sealants) have complied with requirements for cleanliness, surface preparation and priming, structural support, integrity, and continuity of seal.
14. All penetrations have been sealed.

C. Air barriers will be considered defective if they do not pass tests and inspections.

1. Apply additional air-barrier material, according to manufacturer's written instructions, where inspection results indicate insufficient thickness.
2. Remove and replace deficient air-barrier components for retesting as specified above.

D. Repair damage to air barriers caused by testing; follow manufacturer's written instructions.

3.8 CLEANING AND PROTECTION

A. Protect air-barrier system from damage during application and remainder of construction period, according to manufacturer's written instructions. Protect air barrier from contact with incompatible materials and sealants not approved by air-barrier manufacturer.

B. Clean spills, stains, and soiling from construction that would be exposed in the completed work using cleaning agents and procedures recommended by manufacturer of affected construction.

C. Remove masking materials after installation.

END OF SECTION 07 27 29

SECTION 07 44 00 - CEMENTITIOUS PANELS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Cementitious soffit panels with accessories.

1.2 RELATED SECTIONS

A. Section 06 10 00 - Rough Carpentry.

B. Section 09 91 13 – Exterior Painting.

1.3 REFERENCES

A. ASTM International (ASTM):
1. ASTM B136 - Standard Method for Measurement of Stain Resistance of Anodic Coatings on Aluminum.
2. ASTM B244 - Standard Test Method for Measurement of Thickness of Anodic Coatings on Aluminum and of Other Nonconductive Coatings on Nonmagnetic Basis Metals with Eddy-Current Instruments.
3. ASTM C834 - Standard Specification for Latex Sealants.
4. ASTM C920 - Standard Specification for Elastomeric Joint Sealants.
5. ASTM C1186 - Standard Specification for Flat Non-Asbestos Fiber-Cement Sheets.
6. ASTM D523 - Standard Test Method for Specular Gloss.
7. ASTM D1117 - Standard Guide for Evaluating Nonwoven Fabrics.
8. ASTM D1308 - Standard Test Method for Effect of Household Chemicals on Clear and Pigmented Organic Finishes.
9. ASTM D1730 - Standard Practices for Preparation of Aluminum and Aluminum-Alloy Surfaces for Painting.
10. ASTM D2794 - Standard Test Method for Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact).
11. ASTM D3363 - Standard Test Method for Film Hardness by Pencil Test.
12. ASTM D3359 - Standard Test Methods for Rating Adhesion by Tape Test.
13. ASTM D4585 - Standard Practice for Testing Water Resistance of Coatings Using Controlled Condensation.
14. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
15. ASTM E96 - Test Methods for Water Vapor Transmission of Materials.
16. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials.
17. ASTM E136 - Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at 750 degrees C.
18. ASTM E330 - Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure

B. AATCC127 - Water Resistance: Hydrostatic Pressure Test.

C. TAPPI - T460 - Air Resistance of Paper (Gurley Method).

1.4 SUBMITTALS

A. Submit under provisions of Section 01 30 00 - Administrative Requirements.

B. Product Data: Manufacturer's data sheets on each product to be used, including:
   1. Installation instructions and recommendations.
   2. Storage and handling requirements and recommendations.
   3. Manufacturer's best practice guide.
   4. Technical data sheet.
   5. Standard CAD drawings

C. Shop Drawings: Provide detailed drawings of atypical non-standard applications of cladding junctions and penetrations which are outside the scope of the standard details and specifications provided by the manufacturer.

D. Selection Samples: For each finish product specified, two complete sets of color chips representing manufacturer's full range of available colors and patterns.

E. Verification Samples: For each finish product specified, two samples, minimum size 4 by 6 inches (100 by 150 mm), representing actual product, color, and patterns.

1.5 QUALITY ASSURANCE

A. Mock-Up: Provide a mock-up for evaluation of surface preparation techniques
   1. Finish areas designated by Architect.
   2. Do not proceed with remaining work until workmanship, color, and sheen are approved by Architect.
   3. Refinish mock-up area as required to produce acceptable work.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Store products in manufacturer's unopened packaging until ready for installation.

B. Store siding flat on a smooth level surface. Protect edges and corners from chipping. Store sheets under cover and keep dry prior to installing.

C. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

1.7 PROJECT CONDITIONS

A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

1.8 WARRANTY

A. Manufacturer's Warranty: Provide manufacturer’s with 30-year product warranty against manufacturing defects.
   1. Contractor’s material and labor warranty: 2 years.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Basis of Design: James Hardie Building Products, Inc., “Hardiesoffit Panels Non-Vented Smooth” factory primed.

B. Requests for approval of equal substitutions will be considered in accordance with provisions of Section 01 60 00 - Product Requirements.

C. Accessories: Provide all necessary manufacturer’s trim, accessories, fasteners, etc. as required to provide a complete system and installation per manufacturer’s requirements and Industry Standards.

2.2 FINISHES

A. Factory Primer: Provide factory applied universal primer.
   1. Primer: Factory applied sealer/primer by James Hardie. Apply flat sheen finishes to panels.
   2. Topcoat: Refer to Section 09 91 13 – Exterior Painting and Finish Schedule.

PART 3 EXECUTION

3.1 EXAMINATION

A. Do not begin installation until substrates have been properly prepared.

B. If framing preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

A. Clean surfaces thoroughly prior to installation.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

C. Ensure that drainage plane in intact and all penetrations are sealed.

3.3 INSTALLATION

A. Wood Framing: Nominal 2 inch by 4 inch minimum wood framing selected for minimal shrinkage and complying with local building codes, including the use of water-resistive barriers or vapor barriers where required. Minimum 1-1/2 inches (38 mm) face and straight, true, of uniform dimensions and properly aligned.

B. Installation: Install materials in strict accordance with manufacturer's installation instructions and project drawings.
   1. Fastening Method: Countersunk and filled.
   2. Place fasteners no closer than 3/4 inch (9.5 mm) from panel edges and 2 inches (51 mm) from panel corners.
   3. Use fasteners as specified in the manufacturer’s requirements.
   4. Install panel using 1/2 inch (13 mm) spacers at horizontal joints. Leave bottom edge of panel above all horizontal trims exposed, no caulking shall be placed at this overlap

of Horizontal Reveal Trim. Factory primed edge shall always be used.

5. Allow minimum vertical clearance between the bottom edge of siding and any other material in strict accordance with the manufacturer's installation instructions.
6. Maintain clearance between siding and adjacent finished grade.
7. Specific framing and fastener requirements - refer to the applicable building code compliance reports.

3.4 FINISHING

A. Finish factory primed siding with a minimum of one coat of high quality 100 percent acrylic exterior flat grade paint with flat finish within 180 days of installation. Follow paint manufacturer's written product recommendation and written application instructions.

B. Field cut edges shall be coated during the installation process using an exterior grade primer/sealer that is compatible with the type of paint to used on project.

3.5 PROTECTION

A. Protect installed products until completion of project.

B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION

SECTION 07 61 00 - SHEET METAL ROOFING

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:
1. Standing-seam metal roofing, on-site, roll formed at roof.
2. All sheet metal flashing that is adjacent to roof shall be same material as roof.

B. Related Sections:

1. Division 06 Section "Rough Carpentry" for plywood decking below metal roof.
2. Division 07 Section "Thermal Insulation" for roof insulation.
3. Division 07 Section "Sheet Metal Flashing and Trim" for gutters, downspouts, fascia, copings, and flashings that are not part of sheet metal roofing.
4. Division 07 Section "Joint Sealants" for field-applied sealants adjoining sheet metal roofing.

1.3 PERFORMANCE REQUIREMENTS

A. General Performance: Sheet metal roofing system including, but not limited to, metal roof panels, cleats, clips, anchors and fasteners, sheet metal flashing integral with sheet metal roofing, fascia panels, trim, underlayment, and accessories shall comply with requirements indicated without failure due to defective manufacture, fabrication, installation, or other defects in construction. Sheet metal roofing shall remain watertight.

B. Thermal Movements: Provide sheet metal roofing that allows for thermal movements from ambient and surface temperature changes. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.

1. Temperature Change (Range): 120 deg F material surfaces.

C. Solar Reflectance Index: Not less than 78 when calculated according to ASTM E 1980 based on testing identical products by a qualified testing agency.

D. Delegated Design: Design metal roof assembly, plywood and rigid insulation substrate fastened into structural metal deck, including comprehensive engineering analysis by a qualified Professional Engineer registered in Texas, using performance requirements and design criteria indicated.

E. Structural Loads:

1. Wind Loads:

a. Basic Wind Speed: 155 mph.
b. Importance Factor: 1.0.
c. Exposure Category: B.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each manufactured product and accessory.

B. Shop Drawings: Show fabrication and installation layouts of sheet metal roofing, plywood decking, and rigid insulation fastened into metal decking including plans, elevations, expansion joint locations, and keyed details. Distinguish between shop- and field-assembled work. Include the following:

1. Details for forming sheet metal roofing, including seams and dimensions.
2. Details for joining and securing sheet metal roofing, including layout of fasteners, cleats, clips, and other attachments. Include pattern of seams.
3. Details of termination points and assemblies, including fixed points.
4. Details of expansion joints, including showing direction of expansion and contraction.
5. Details of roof penetrations.
6. Details of edge conditions, including eaves, ridges, valleys, rakes, crickets, and counterflashings.
7. Details of special conditions.
8. Details of connections to adjoining work.
9. Detail the following accessory items, at a scale of not less than 1-1/2 inches per 12 inches (1:10):

a. Flashing and trim.
b. Gutters and downspouts as they relate to adjacent sheet metal roofing. Ref. Section 076200.
c. Roof curbs.

C. Samples for Initial Selection: For each type of sheet metal roofing indicated, with factory-applied color finishes.

1. Include similar Samples of trim and accessories involving color selection.

D. Samples for Verification: For each type of exposed finish required, prepared on Samples of size indicated below:

1. Sheet Metal Roofing: 12 inches (300 mm) long by actual width of unit, including finished seam and in required profile. Include fasteners, cleats, clips, and other attachments.
2. Trim and Metal Closures: 12 inches (300 mm) long and in required profile. Include fasteners and other exposed accessories.
3. Other Accessories: 12-inch- (300-mm-) long Samples for each type of other accessory.

1.5 INFORMATIONAL SUBMITTALS

A. Coordination Drawings: Roof plans drawn to scale with coordinated details for penetrations and roof-mounted items. Show the following:

1. Sheet metal roofing and attachments.
2. Roof-mounted items including roof hatches, equipment supports, pipe supports and penetrations, lighting fixtures, snow guards, and items mounted on roof curbs.

B. Portable Roll-Forming Equipment Certificate: Issued by UL for equipment manufacturer's portable roll-forming equipment capable of producing panels that comply with UL requirements. Show expiration date no earlier than two months after scheduled completion of sheet metal roofing.

1. Submit certificates indicating recertification of equipment whose certification has expired during the construction period.

C. Qualification Data: For qualified Installer and fabricator.

D. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for each product.

E. Warranties: Sample of special warranties.

1.6 CLOSEOUT SUBMITTALS

A. Maintenance Data: For roofing sheet metals and accessories to include in maintenance manuals.

1.7 QUALITY ASSURANCE

A. Custom-Fabricated Sheet Metal Roofing Fabricator Qualifications: Shop that employs skilled workers who custom fabricate sheet metal roofing similar to that required for this Project and whose products have a record of successful in-service performance.

B. Roll-Formed Sheet Metal Roofing Fabricator Qualifications: Fabricator authorized by portable roll-forming equipment manufacturer to fabricate and install sheet metal roofing units required for this Project, and who maintains current UL certification of its portable roll-forming equipment.

A. UL-Certified, Portable Roll-Forming Equipment: UL-certified, portable roll-forming equipment capable of producing roofing panels for sheet metal roofing assemblies that comply with UL 580 for the following wind uplift resistance based on local code and a wind speed of 110 mph. Minimum wind pressures should include a 2x safety factor. Maintain UL certification of portable roll-forming equipment for duration of sheet metal roofing work.

B. Sheet Metal Roofing Standard: Comply with SMACNA's "Architectural Sheet Metal Manual" unless more stringent requirements are specified or shown on Drawings.

C. Mockups: Build mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for fabrication and installation.

1. Build mockup of typical roof area and eave as shown on Drawings; approximately 48 inches (1200 mm) square by full thickness, including attachments, underlayment, and accessories.
2. Build mockups for typical roof area only, including accessories.

3. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
4. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

D. Preliminary Roofing Conference: Before starting roof deck construction, conduct conference at Project site. Comply with requirements for preinstallation conferences in Division 01 Section "Project Management and Coordination."

1. Review methods and procedures related to roof deck construction and sheet metal roofing including, but not limited to, items listed for the Preinstallation Conference.

E. Preinstallation Conference: Conduct conference at Project site.

1. Meet with Owner, Architect, Owner's insurer if applicable, sheet metal roofing Installer, portable roll-forming equipment manufacturer's representative for sheet metal roofing, Installer, and installers whose work interfaces with or affects sheet metal roofing including installers of roof accessories and roof-mounted equipment.
2. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.

3. Review methods and procedures related to sheet metal roofing installation, including portable roll-forming equipment manufacturer's written instructions.
4. Examine metal deck, sheathing, and membrane underlayment conditions for compliance with requirements, including flatness and attachment to structural members.
5. Review structural loading limitations of concrete deck, and plywood sheathing during and after roofing installation.
6. Review flashings, special roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that will affect sheet metal roofing.
7. Review governing regulations and requirements for insurance, certificates, and testing and inspecting if applicable.
8. Review temporary protection requirements for sheet metal roofing during and after roofing installation.
9. Review roof observation and repair procedures after sheet metal roofing installation.
10. Document proceedings, including corrective measures and actions required, and furnish copy of record to each participant.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Do not store sheet metal roofing materials in contact with other materials that might cause staining, denting, or other surface damage. Store sheet metal roofing materials away from uncured concrete and masonry.

B. Protect strippable protective covering on sheet metal roofing from exposure to sunlight and high humidity, except to the extent necessary for the period of sheet metal roofing installation.

1.9 COORDINATION

A. Coordinate installation of roof curbs, equipment supports, and roof penetrations, which are specified in other Sections.

B. Coordinate sheet metal roofing with rain drainage work, flashing, trim, and construction of metal decks, sheathing, parapets, walls, adjacent low-slope modified bitumen roofing and other adjoining work to provide a leakproof, secure, and noncorrosive installation.

1.10 WARRANTY

A. Special Warranty: Warranty form at the end of this Section in which Installer agrees to repair or replace components of sheet metal roofing 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 rupturing, cracking, or puncturing.
b. Wrinkling or buckling.
c. Loose parts.

d. Failure to remain weathertight, including uncontrolled water leakage.
e. Deterioration of metals, metal finishes, and other materials beyond normal weathering, including non-uniformity of color or finish.
f. Galvanic action between sheet metal roofing and dissimilar materials.

2. Warranty Period: Two years from date of Substantial Completion.

B. Special Warranty on Finishes: Manufacturer's standard form in which manufacturer agrees to repair finish or replace sheet metal roofing that shows evidence of deterioration of factory-applied finishes within specified warranty period.

1. Exposed Panel Finish: Deterioration includes, but is not limited to, the following:

a. Color fading more than 5 Hunter units when tested according to ASTM D 2244.
b. Chalking in excess of a No. 8 rating when tested according to ASTM D 4214.
c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.

2. Finish Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 ROOFING SHEET METALS

A. General: Protect mechanical and other finishes on exposed surfaces from damage by applying a strippable, temporary protective film before shipping.

B. Basis of Design: Berridge “Double-lock Zee-lock System”, or approved equal.

C. Metallic-Coated Steel Sheet: Restricted flatness steel sheet, metallic coated by the hot-dip process and prepainted by the coil-coating process to comply with ASTM A 755/A 755M.

1. Zinc-Coated (Galvanized) Steel Sheet: ASTM A 653/A 653M, G90 (Z275) coating designation; structural quality with fluorocarbon coating produced with Kynar 500.
2. Thickness: Nominal 0.024 inch (0.56 mm) minimum unless otherwise indicated.

3. Surface: Smooth, flat.
4. Exposed Coil-Coated Finish:
a. Three-Coat Fluoropolymer: AAMA 621. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in both color coat and clear topcoat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

5. Color: “Natural Metal Finish - Acrylic-Coated Galvalume”.
6. Concealed Finish: Pretreat with manufacturer's standard white or light-colored acrylic or polyester-backer finish, consisting of prime coat and wash coat with a minimum total dry film thickness of 0.5 mil (0.013 mm).

2.2 UNDERLAYMENT MATERIALS

A. Self-Adhering, High-Temperature Sheet: Minimum 30 to 40 mils (0.76 to 1.0 mm) thick, consisting of slip-resisting polyethylene-film top surface laminated to layer of butyl or SBS-modified asphalt adhesive, with release-paper backing; cold applied. Provide primer when recommended by underlayment manufacturer.

1. Thermal Stability: ASTM D 1970; stable after testing at 240 deg F (116 deg C).
2. Low-Temperature Flexibility: ASTM D 1970; passes after testing at minus 20 deg F (29 deg C).
3. Products: Subject to compliance with requirements, provide one of the following:

a. Carlisle Coatings & Waterproofing Inc.; CCW WIP 300HT.
b. Grace Construction Products, a unit of W. R. Grace & Co.; Ultra.
c. Henry Company; Blueskin PE200 HT.
d. Metal-Fab Manufacturing, LLC; MetShield.
e. Owens Corning; WeatherLock Metal High-Temperature Underlayment.

B. Slip Sheet: Building paper, 3-lb/100 sq. ft. (0.16-kg/sq. m) minimum, rosin sized.

2.3 MISCELLANEOUS MATERIALS

A. General: Provide materials and types of fasteners, solder, welding rods, protective coatings, separators, sealants, and other miscellaneous items as required for a complete roofing system and as recommended by fabricator for sheet metal roofing.

B. Fasteners: Wood screws, annular-threaded nails, self-tapping screws, self-locking rivets and bolts, and other suitable fasteners designed to withstand design loads.

1. General:
a. Blind Fasteners: High-strength stainless-steel rivets suitable for metal being fastened.

2. Fasteners: Series 300 stainless steel.

C. Solder:

1. For Zinc-Coated (Galvanized) Steel: ASTM B 32, Grade Sn50, 50 percent tin and 50 percent lead or Grade Sn60, 60 percent tin and 40 percent lead.

D. Sealant Tape: Pressure-sensitive, 100 percent solids, gray polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape 1/2 inch (13 mm) wide and 1/8 inch (3 mm) thick.

E. Elastomeric Sealant: ASTM C 920, elastomeric silicone polymer sealant as recommended by portable roll-forming equipment manufacturer for installation indicated; low modulus; of type,

grade, class, and use classifications required to seal joints in sheet metal roofing and remain watertight.

F. Butyl Sealant: ASTM C 1311, single-component, solvent-release butyl rubber sealant; polyisobutylene plasticized; heavy bodied for hooked-type expansion joints with limited movement.

G. Bituminous Coating: Cold-applied asphalt emulsion complying with ASTM D 1187.

2.4 ACCESSORIES

A. Sheet Metal Accessories: Provide components required for a complete sheet metal roofing assembly including trim, copings, fasciae, corner units, clips, flashings, sealants, gaskets, fillers, metal closures, closure strips, and similar items. Match material and finish of sheet metal roofing unless otherwise indicated.

1. Provide accessories as recommended by portable roll-forming equipment manufacturer to produce sheet metal roofing assemblies that comply with UL 580 for wind-uplift resistance classification specified in "Quality Assurance" Article..
2. Cleats: For mechanically seaming into joints and formed from the following materials:

   a. Metallic-Coated Steel Roofing: 0.0220-inch thick stainless steel.
3. Backing Plates: Plates at roofing splices, fabricated from material recommended by SMACNA.
4. Closure Strips: Closed-cell, expanded, cellular, rubber or crosslinked, polyolefin foam or closed-cell laminated polyethylene; minimum 1-inch- (25-mm-) thick, flexible-closure strips; cut or premolded to match sheet metal roofing profile. Provide closure strips where indicated or necessary to ensure weathertight construction.
5. Flashing and Trim: Formed from same material and with same finish as sheet metal roofing, minimum 0.024 inch thick.

B. Pipe Flashing: Premolded, EPDM pipe collar with flexible aluminum ring bonded to base.

2.5 FABRICATION

A. General: Custom fabricate sheet metal roofing to comply with details shown and recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to the design, dimensions (panel width and seam height), geometry, metal thickness, and other characteristics of installation indicated. Fabricate sheet metal roofing and accessories at the shop to greatest extent possible.

1. Standing-Seam Roofing: Form standing-seam panels with finished seam height as indicated.

B. General: Fabricate roll-formed sheet metal roofing panels with UL-certified, portable roll-forming equipment capable of producing roofing panels for sheet metal roofing assemblies that

comply with UL 580 for wind-uplift resistance classification specified in "Quality Assurance" Article. Fabricate roll-formed sheet metal according to equipment manufacturer's written instructions and to comply with details shown.

C. Fabrication Tolerances: Fabricate sheet metal roofing that is capable of installation to a tolerance of 1/4 inch in 20 feet (6 mm in 6 m) on slope and location lines as indicated and within 1/8-inch (3-mm) offset of adjoining faces and of alignment of matching profiles.

D. Fabrication Tolerances: Fabricate sheet metal roofing that is capable of installation to tolerances specified in MCA's "Guide Specification for Residential Metal Roofing."

E. Form exposed sheet metal work to fit substrates without excessive oil canning, buckling, and tool marks; true to line and levels indicated; and with exposed edges folded back to form hems.

1. Lay out sheet metal roofing so transverse seams, if required, are made in direction of flow with higher panels overlapping lower panels.
2. Offset transverse seams from each other 12 inches (300 mm) minimum.
3. Fold and cleat eaves and transverse seams in the shop.
4. Form and fabricate sheets, seams, strips, cleats, valleys, ridges, edge treatments, integral flashings, and other components of metal roofing to profiles, patterns, and drainage arrangements shown on Drawings and as required for leakproof construction.

F. Expansion Provisions: Fabricate sheet metal roofing to allow for expansion in running work sufficient to prevent leakage, damage, and deterioration of the Work. Where lapped expansion provisions cannot be used, form expansion joints of intermeshing hooked flanges, not less than 1 inch (25 mm) deep, filled with butyl sealant concealed within joints.

G. Sealant Joints: Where movable, non-expansion-type joints are indicated or required to produce weathertight seams, form metal to provide for proper installation of elastomeric sealant in compliance with SMACNA standards.

H. Metal Protection: Where dissimilar metals will contact each other, protect against galvanic action by painting contact surfaces with bituminous coating, by applying self-adhering sheet underlayment to each contact surface, or by other permanent separation as recommended by fabricator of sheet metal roofing or manufacturers of the metals in contact.

I. Sheet Metal Accessories: Custom fabricate flashings and trim to comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, metal, and other characteristics of item indicated. Obtain field measurements for accurate fit before shop fabrication.

1. Form exposed sheet metal accessories without excessive oil canning, buckling, and tool marks and true to line and levels indicated, with exposed edges folded back to form hems.

2. Seams: Fabricate nonmoving seams with flat-lock seams. Tin edges to be seamed, form seams, and solder.

3. Seams: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with elastomeric sealant unless otherwise recommended by sealant manufacturer for intended use.
4. Sealed Joints: Form non-expansion but movable joints in metal to accommodate elastomeric sealant.
5. Conceal fasteners and expansion provisions where possible. Exposed fasteners are not allowed on faces of accessories exposed to view.
6. Fabricate cleats and attachment devices of sizes as recommended by SMACNA's "Architectural Sheet Metal Manual" for application, but not less than thickness of metal being secured.

J. Do not use graphite pencils to mark metal surfaces.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, substrate, and other conditions affecting performance of the Work.

1. Ensue that plywood decking has been installed per structural requirements to resist Code required wind uplift.

2. Examine solid roof sheathing to verify that sheathing joints are supported by structural deck, that tops of fasteners are flush with surface, and that installation is within flatness tolerances required for finished roofing installation.
3. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and completely anchored, and that provision has been made for drainage, flashings, and penetrations through sheet metal roofing.

B. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.

C. Examine roughing-in for components and systems penetrating sheet metal roofing to verify actual locations of penetrations relative to seam locations of sheet metal roofing before installation.

D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 UNDERLAYMENT INSTALLATION

A. Self-Adhering Sheet Underlayment: Install self-adhering sheet underlayment, wrinkle free, on roof sheathing under sheet metal roofing. Apply primer if required by underlayment

manufacturer. Comply with temperature restrictions of underlayment manufacturer for installation; use primer rather than nails for installing underlayment at low temperatures. Apply over entire roof, in shingle fashion to shed water, with end laps of not less than 6 inches (150 mm) staggered 24 inches (600 mm) between courses. Overlap side edges not less than 3-1/2 inches (90 mm). Roll laps with roller. Cover underlayment within 14 days.

B. Install flashings to cover underlayment to comply with requirements in Division 07 Section "Sheet Metal Flashing and Trim."

C. Apply slip sheet before installing sheet metal roofing.

3.3 INSTALLATION, GENERAL

A. General: Anchor sheet metal roofing and other components of the Work securely in place, with provisions for thermal and structural movement. Install fasteners, solder, welding rods, protective coatings, separators, sealants, and other miscellaneous items as required for a complete roofing system and as recommended by fabricator for sheet metal roofing.

1. Field cutting of sheet metal roofing by torch is not permitted.
2. Provide metal closures at peaks, rake edges, rake walls, eaves and each side of ridge and hip caps.
3. Flash and seal sheet metal roofing with closure strips at eaves, rakes, and perimeter of all openings. Fasten with self-tapping screws.
4. Locate and space fastenings in uniform vertical and horizontal alignment. Predrill panels for fasteners.
5. Install ridge and hip caps as sheet metal roofing work proceeds.
6. Locate roofing splices over, but not attached to, structural supports. Stagger roofing splices and end laps to avoid a four-panel lap splice condition. Install backing plates at roofing splices.
7. Install sealant tape where indicated.
8. Lap metal flashing over sheet metal roofing to allow moisture to run over and off the material.
9. Do not use graphite pencils to mark metal surfaces.

B. Thermal Movement. Rigidly fasten metal roof panels to structure at only one location for each panel. Allow remainder of panel to move freely for thermal expansion and contraction.

1. Point of Fixity: Fasten each panel along a single line of fixing located at ridge.
2. Avoid attaching accessories through roof panels in a manner that will inhibit thermal movement.

C. Fasteners: Use fasteners of sizes that will penetrate wood sheathing as required by manufacturer to achieve maximum pull-out resistance and meet structural engineering design requirements.

D. Metal Protection: Where dissimilar metals will contact each other or corrosive substrates, protect against galvanic action by painting contact surfaces with bituminous coating, by applying self-adhering sheet underlayment to each contact surface, or by other permanent separation as recommended by SMACNA.

E. Conceal fasteners and expansion provisions where possible in exposed work and locate to minimize possibility of leakage. Cover and seal fasteners and anchors as required for a tight installation.

F. Fascia: Align bottom of sheet metal roofing and fasten with blind rivets, bolts, or self-tapping screws. Flash and seal sheet metal roofing with closure strips where fasciae meet soffits, along lower panel edges, and at perimeter of all openings.

3.4 ON-SITE, ROLL-FORMED SHEET METAL ROOFING INSTALLATION

A. General: Install on-site, roll-formed sheet metal roofing fabricated from UL-certified equipment to comply with equipment manufacturer's written instructions for UL wind-uplift resistance class indicated. Provide sheet metal roofing of full length from eave to ridge unless otherwise restricted by on-site or shipping limitations.

B. Standing-Seam Sheet Metal Roofing: Fasten sheet metal roofing to supports with concealed clips at each standing-seam joint at location, at spacing, and with fasteners recommended by manufacturer of portable roll-forming equipment.

1. Install clips to substrate with self-tapping fasteners.
2. Install pressure plates at locations indicated in equipment manufacturer's written installation instructions.
3. Before panels are joined, apply continuous bead of sealant to top of flange of lower panel.
4. Seamed Joint: Crimp standing seams with manufacturer-approved motorized seamer tool so cleat, sheet metal roofing, and field-applied sealant are completely engaged.

C. Seal joints as shown and as required for watertight construction. For roofing with 3:12 slopes or less, use cleats at transverse seams.

1. Where sealant-filled joints are used, embed hooked flanges of joint members not less than 1 inch (25 mm) into sealant. Form joints to completely conceal sealant. When ambient temperature at time of installation is moderate, between 40 and 70 deg F (4 and 21 deg C), set joint members for 50 percent movement either way. Adjust setting proportionately for installation at higher ambient temperatures. Do not install sealant-type joints at temperatures below 40 deg F (4 deg C).

2. Prepare joints and apply sealants to comply with requirements in Division 07 Section "Joint Sealants."

3.5 ACCESSORY INSTALLATION

A. General: Install accessories with positive anchorage to building and weathertight mounting and provide for thermal expansion. Coordinate installation with flashings and other components.

1. Install components required for a complete sheet metal roofing assembly including trim, copings, seam covers, flashings, sealants, gaskets, fillers, metal closures, closure strips, and similar items.
2. Install accessories integral to sheet metal roofing that are specified in Division 07 Section "Sheet Metal Flashing and Trim" to comply with that Section's requirements.

B. Flashing and Trim: Comply with performance requirements, manufacturer's written installation instructions, and SMACNA's "Architectural Sheet Metal Manual." Provide concealed fasteners where possible, and set units true to line and level as indicated. Install work with laps, joints, and seams that will be permanently watertight and weather resistant.

1. Install flashing and trim as required to seal against weather and to provide finished appearance. Locations include, but are not limited to, eaves, rakes, corners, bases, framed openings, ridges, fasciae, and fillers.
2. Install continuous strip of self-adhering underlayment at edge of continuous flashing overlapping self-adhering underlayment, where "continuous seal strip" is indicated in SMACNA's "Architectural Sheet Metal Manual," and where indicated on Drawings.
3. Install exposed flashing and trim without excessive oil canning, buckling, and tool marks and true to line and levels indicated, with exposed edges folded back to form hems. Install sheet metal flashing and trim to fit substrates and to result in waterproof and weather-resistant performance.
4. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at a maximum of 10 feet (3 m) with no joints allowed within 24 inches (600 mm) of corner or intersection. Where lapped expansion provisions cannot be used or would not be sufficiently weather resistant and waterproof, form expansion joints of intermeshing hooked flanges, not less than 1 inch (25 mm) deep, and filled with butyl sealant concealed within joints.

C. Pipe Flashing: Form flashing around pipe penetration and sheet metal roofing. Fasten and seal to sheet metal roofing as recommended by SMACNA.

3.6 ERECTION TOLERANCES

A. Installation Tolerances: Shim and align sheet metal roofing within installed tolerance of 1/4 inch in 20 feet (6 mm in 6 m) on slope and location lines as indicated and within 1/8-inch (3-mm) offset of adjoining faces and of alignment of matching profiles.

B. Installation Tolerances: Shim and align sheet metal roofing within installed tolerances specified in MCA's "Guide Specification for Residential Metal Roofing."

3.7 CLEANING AND PROTECTION

A. Clean exposed metal surfaces of substances that interfere with uniform oxidation and weathering.

B. Clean and neutralize flux materials. Clean off excess solder.

C. Clean off excess sealants.

D. Remove temporary protective coverings and strippable films as sheet metal roofing is installed unless otherwise indicated in manufacturer's written installation instructions. On completion of sheet metal roofing installation, clean finished surfaces as recommended by sheet metal roofing manufacturer. Maintain sheet metal roofing in a clean condition during construction.

E. Replace sheet metal roofing components that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

3.8 ROOFING INSTALLER'S WARRANTY

A. WHEREAS <Insert name> of <Insert address>, herein called the "Roofing Installer," has performed roofing and associated work ("work") on the following project:

1. Owner: <Insert name of Owner>.
2. Address: <Insert address>.
3. Building Name/Type: <Insert information>.
4. Address: <Insert address>.
5. Area of Work: <Insert information>.
6. Acceptance Date: <Insert date>.
7. Warranty Period: <Insert time>.
8. Expiration Date: <Insert date>.

B. AND WHEREAS Roofing Installer has contracted (either directly with Owner or indirectly as a subcontractor) to warrant said work against leaks and faulty or defective materials and workmanship for designated Warranty Period,

C. NOW THEREFORE Roofing Installer hereby warrants, subject to terms and conditions herein set forth, that during Warranty Period he will, at his own cost and expense, make or cause to be made such repairs to or replacements of said work as are necessary to correct faulty and defective work and as are necessary to maintain said work in a watertight condition.

D. This Warranty is made subject to the following terms and conditions:

1. Specifically excluded from this Warranty are damages to work and other parts of the building, and to building contents, caused by:

a. Lightning;

b. Peak gust wind speed exceeding 139 mph;
c. Fire;
d. Failure of roofing system substrate, including cracking, settlement, excessive deflection, deterioration, and decomposition;
e. Faulty construction of parapet walls, copings, chimneys, skylights, vents, equipment supports, and other edge conditions and penetrations of the work;
f. Vapor condensation on bottom of roofing; and
g. Activity on roofing by others, including construction contractors, maintenance personnel, other persons, and animals, whether authorized or unauthorized by Owner.

2. When work has been damaged by any of foregoing causes, Warranty shall be null and void until such damage has been repaired by Roofing Installer and until cost and expense thereof have been paid by Owner or by another responsible party so designated.
3. Roofing Installer is responsible for damage to work covered by this Warranty but is not liable for consequential damages to building or building contents resulting from leaks or faults or defects of work.
4. During Warranty Period, if Owner allows alteration of work by anyone other than Roofing Installer, including cutting, patching, and maintenance in connection with penetrations, attachment of other work, and positioning of anything on roof, this Warranty shall become null and void on date of said alterations, but only to the extent said alterations affect work covered by this Warranty. If Owner engages Roofing Installer to perform said alterations, Warranty shall not become null and void unless Roofing Installer, before starting said work, shall have notified Owner in writing, showing reasonable cause for claim, that said alterations would likely damage or deteriorate work, thereby reasonably justifying a limitation or termination of this Warranty.
5. During Warranty Period, if original use of roof is changed and it becomes used for, but was not originally specified for, a promenade, work deck, spray-cooled surface, flooded basin, or other use or service more severe than originally specified, this Warranty shall become null and void on date of said change, but only to the extent said change affects work covered by this Warranty.
6. Owner shall promptly notify Roofing Installer of observed, known, or suspected leaks, defects, or deterioration and shall afford reasonable opportunity for Roofing Installer to inspect work and to examine evidence of such leaks, defects, or deterioration.

7. This Warranty is recognized to be the only warranty of Roofing Installer on said work and shall not operate to restrict or cut off Owner from other remedies and resources lawfully available to Owner in cases of roofing failure. Specifically, this Warranty shall not operate to relieve Roofing Installer of responsibility for performance of original work

according to requirements of the Contract Documents, regardless of whether Contract was a contract directly with Owner or a subcontract with Owner's General Contractor.

E. IN WITNESS THEREOF, this instrument has been duly executed this <Insert day> day of <Insert month>, <Insert year>.

1. Authorized Signature: <Insert signature>.
2. Name: <Insert name>.
3. Title: <Insert title>.

END OF SECTION 07 61 00

SECTION 076200 - SHEET METAL FLASHING AND TRIM

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:

1. Manufactured Products:

   a. Manufactured through-wall flashing and counterflashing. Coordinate with all other building envelope sections.
   b. Manufactured reglets and counterflashing.
   c. Anodized aluminum sheet metal flashings: edge metal, gutters, downspouts, copings, fascia as depicted on drawings.

2. Formed Products:

   a. Formed roof drainage sheet metal fabrications.
   b. Formed equipment support flashing.

B. Related Sections:

1. Division 06 Section "Rough Carpentry" for wood nailers, curbs, and blocking.
2. Division 07 Section "Air and Moisture Barrier Coatings".
3. Division 07 Section "Sheet Metal Roofing" for sheet metal flashing and trim integral with metal roof panels.

1.3 PERFORMANCE REQUIREMENTS

A. General: Sheet metal flashing and trim assemblies as indicated shall withstand wind loads, structural movement, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Completed sheet metal flashing and trim shall not rattle, leak, or loosen, and shall remain watertight.

B. Delegated Design: Design metal roof assembly and plywood substrate, including comprehensive engineering analysis by a qualified Professional Engineer registered in Texas, using performance requirements and design criteria indicated. Base Wind Speed: 155 mph.

C. Fabricate and install roof edge flashing and copings capable of resisting the following forces according to recommendations in FMG Loss Prevention Data Sheet 1-49, ANSI/SPRI ES-1 tested and approved assemblies: Minimum pressures:

1. Wind Zone 2: For velocity pressures of 31 to 45 lbf/sq. ft. (1.48 to 2.15 kPa): 90-lbf/sq. ft. (4.31-kPa) perimeter uplift force, 120-lbf/sq. ft. (5.74-kPa) corner uplift force, and 45-lbf/sq. ft. (2.15-kPa) outward force. Final pressures shall be determined per PE calculations.

D. Thermal Movements: Provide sheet metal flashing and trim that allows for thermal movements from ambient and surface temperature changes.

1. Temperature Change (Range): 180 deg F (100 deg C), material surfaces.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each manufactured product and accessory.

B. Shop Drawings: Show fabrication and installation layouts of sheet metal flashing and trim, including plans, elevations, expansion-joint locations, and keyed details. Distinguish between shop- and field-assembled work. Include the following:

1. Identification of material, thickness, weight, and finish for each item and location in Project.
2. Details for forming sheet metal flashing and trim, including profiles, shapes, seams, and dimensions.
3. Details for joining, supporting, and securing sheet metal flashing and trim, including layout of fasteners, cleats, clips, and other attachments. Include pattern of seams.
4. Details of termination points and assemblies, including fixed points.
5. Details of expansion joints and expansion-joint covers, including showing direction of expansion and contraction.
6. Details of edge conditions, including eaves, ridges, valleys, rakes, crickets, and counterflashings as applicable.
7. Details of special conditions.
8. Details of connections to adjoining work.
9. Detail formed flashing and trim at a scale of not less than 3 inches per 12 inches (1:5).

C. Samples for Initial Selection: For each type of sheet metal flashing, trim, and accessory indicated with factory-applied color finishes involving color selection.

D. Samples for Verification: For each type of exposed finish required, prepared on Samples of size indicated below:

1. Sheet Metal Flashing: 12 inches (300 mm) long by actual width of unit, including finished seam and in required profile. Include fasteners, cleats, clips, closures, and other attachments.
2. Trim, Metal Closures, Expansion Joints, Joint Intersections, and Miscellaneous Fabrications: 12 inches (300 mm) long and in required profile. Include fasteners and other exposed accessories.
3. Accessories and Miscellaneous Materials: Full-size Sample.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified fabricator.

B. Warranty: Sample of special warranty.

1.6 CLOSEOUT SUBMITTALS

A. Maintenance Data: For sheet metal flashing, trim, and accessories to include in maintenance manuals.

1.7 QUALITY ASSURANCE

A. Fabricator Qualifications: Shop that employs skilled workers who custom fabricate sheet metal flashing and trim similar to that required for this Project and whose products have a record of successful in-service performance.

B. Sheet Metal Flashing and Trim Standard: Comply with SMACNA's "Architectural Sheet Metal Manual" unless more stringent requirements are specified or shown on Drawings.

C. Mockups: Build mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for fabrication and installation.

1. Build mockup of typical roof eave, including fascia, fascia trim, approximately [10 feet (3.0 m) long, including supporting construction cleats, seams, attachments, underlayment, and accessories.
2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
3. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

D. Pre-installation Conference: Conduct conference at Project site.

1. Meet with Owner, Architect, Owner's insurer if applicable, Installer, and installers whose work interfaces with or affects sheet metal flashing and trim including installers of roofing materials, roof accessories, unit skylights, and roof-mounted equipment.
2. Review methods and procedures related to sheet metal flashing and trim.
3. Examine substrate conditions for compliance with requirements, including flatness and attachment to structural members.
4. Review special roof details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that will affect sheet metal flashing.
5. Prior to commencement of field operations a pre-installation conference shall be held to establish procedures to maintain optimum working conditions and to coordinate this work with related and adjacent work.

6. Document proceedings, including corrective measures and actions required, and furnish copy of record to each participant.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Do not store sheet metal flashing and trim materials in contact with other materials that might cause staining, denting, or other surface damage. Store sheet metal flashing and trim materials away from uncured concrete and masonry.

B. Protect strippable protective covering on sheet metal flashing and trim from exposure to sunlight and high humidity, except to the extent necessary for the period of sheet metal flashing and trim installation.

1.9 WARRANTY

A. Special Warranty on Finishes: Manufacturer's standard form in which manufacturer agrees to repair finish or replace sheet metal flashing and trim that shows evidence of deterioration of factory-applied finishes within specified warranty period.

1. Exposed Panel Finish: Deterioration includes, but is not limited to, the following:

a. Color fading more than 5 Hunter units when tested according to ASTM D 2244.
b. Chalking in excess of a No. 8 rating when tested according to ASTM D 4214.
c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.

2. Finish Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 SHEET METALS

A. General: Protect mechanical and other finishes on exposed surfaces from damage by applying a strippable, temporary protective film before shipping.

B. Aluminum Sheet: ASTM B 209 (ASTM B 209M), alloy as standard with manufacturer for finish required, with temper as required to suit forming operations and performance required.

1. Clear Anodic Finish, Coil Coated: AAMA 611, AA-M12C22A41, Class I, 0.018 mm or thicker.

C. Stainless-Steel Sheet: ASTM A 240/A 240M or ASTM A 666, Type 304, dead soft, fully annealed.

1. Finish: 2D (dull, cold rolled).
2. Surface: Smooth, flat.

2.2 UNDERLAYMENT MATERIALS

A. Self-Adhering, High-Temperature Sheet: Minimum 40 mils (0.76 to 1.0 mm) thick, consisting of slip-resisting polyethylene-film top surface laminated to layer of butyl or SBS-modified asphalt adhesive, with release-paper backing; cold applied. Provide primer when recommended by underlayment manufacturer.

1. Thermal Stability: ASTM D 1970; stable after testing at 240 deg F (116 deg C).
2. Low-Temperature Flexibility: ASTM D 1970; passes after testing at minus 20 deg F (29 deg C).
3. 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.; CCW WIP 300HT.
   b. Grace Construction Products, a unit of W. R. Grace & Co.; Ice and Water Shield HT. Provide alternate price for Grace "Ultra".
   c. Henry Company; Blueskin PE200 HT.

2.3 MISCELLANEOUS MATERIALS

A. General: Provide materials and types of fasteners, solder, welding rods, protective coatings, separators, sealants, and other miscellaneous items as required for complete sheet metal flashing and trim installation and recommended by manufacturer of primary sheet metal or manufactured item unless otherwise indicated.

B. Fasteners: Wood screws, annular threaded nails, self-tapping screws, self-locking rivets and bolts, and other suitable fasteners designed to withstand design loads and recommended by manufacturer of primary sheet metal or manufactured item.

1. General: Blind fasteners or self-drilling screws, gasketed, with hex-washer head.

   a. Exposed Fasteners: (No exposed fasteners allowed in areas that can be viewed by public.) Heads matching color of sheet metal using plastic caps or factory-applied coating.
   b. Blind Fasteners: High-strength aluminum or stainless-steel rivets suitable for metal being fastened.
2. Fasteners for Aluminum Sheet: Series 300 stainless steel.
3. Fasteners for Stainless-Steel Sheet: Series 300 stainless steel.

C. Solder:
1. For Stainless Steel: ASTM B 32, Grade Sn60, with an acid flux of type recommended by stainless-steel sheet manufacturer.

D. Sealant Tape: Pressure-sensitive, 100 percent solids, gray polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, non-sag, non-toxic, non-staining tape 1/2 inch (13 mm) wide and 1/8 inch (3 mm) thick.

E. Elastomeric Sealant: ASTM C 920, elastomeric silicone polymer sealant; low modulus; of type, grade, class, and use classifications required to seal joints in sheet metal flashing and trim and remain watertight. Reference Section 079200.

F. Butyl Sealant (concealed applications only): ASTM C 1311, single-component, solvent-release butyl rubber sealant; polyisobutylene plasticized; heavy bodied for hooked-type expansion joints with limited movement.

G. Epoxy Seam Sealer: Two-part, noncorrosive, aluminum seam-cementing compound, recommended by aluminum manufacturer for exterior nonmoving joints, including riveted joints.

H. Bituminous Coating: Cold-applied asphalt emulsion complying with ASTM D 1187.

I. Asphalt Roofing Cement: ASTM D 4586, asbestos free, of consistency required for application.

2.4 MANUFACTURED SHEET METAL FLASHING AND TRIM

A. Through-Wall Sheet Metal Flashing: Manufacture through-wall sheet metal flashing for embedment in masonry. Manufacture through-wall flashing with snaplock receiver on exterior face to receive counterflashing where required. (Shop fabricated may also be allowed provided acceptable appearance and quality can be provided).

1. Stainless Steel: 0.016 inch (0.40 mm) thick.

a. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

1) Cheney Flashing Company; Cheney Flashing (Dovetail).
2) Cheney Flashing Company; Cheney Flashing (Sawtooth).
3) Hohmann & Barnard, Inc.; STF Sawtooth Flashing.
4) Keystone Flashing Company, Inc.; Keystone Three-Way Interlocking Thruwall Flashing.
5) Sandell Manufacturing Company, Inc.; Pre-Formed Metal Flashing.

B. Reglets: Units of type, material, and profile indicated, formed to provide secure interlocking of separate reglet and counterflashing pieces, and compatible with flashing indicated with interlocking counterflashing on exterior face, of same metal as reglet.

1. 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]:
2. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:

a. Cheney Flashing Company.
b. Fry Reglet Corporation.
c. Heckmann Building Products Inc.

d. Hickman, W. P. Company.
e. Hohmann & Barnard, Inc.; STF Sawtooth Flashing.
f. Keystone Flashing Company, Inc.
g. National Sheet Metal Systems, Inc.
h. Sandell Manufacturing Company, Inc.

3. Material: Stainless steel, 0.019 inch (0.48 mm) thick.
4. Masonry Type: Provide with offset top flange for embedment in masonry mortar joint.
5. Accessories:

a. Flexible-Flashing Retainer: Provide resilient plastic or rubber accessory to secure flexible flashing in reglet where clearance does not permit use of standard metal counterflashing or where Drawings show reglet without metal counterflashing.
b. Counterflashing Wind-Restraint Clips: Provide clips to be installed before counterflashing to prevent wind uplift of counterflashing lower edge.

6. Finish: Mill.

2.5 FABRICATION, GENERAL

A. General: Custom fabricate sheet metal flashing and trim to comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, geometry, metal thickness, and other characteristics of item indicated. Fabricate items at the shop to greatest extent possible.

1. Fabricate sheet metal flashing and trim in thickness or weight needed to comply with performance requirements, but not less than that specified for each application and metal.
2. Obtain field measurements for accurate fit before shop fabrication.
3. Form sheet metal flashing and trim **without oil canning**, buckling, and tool marks and true to line and levels indicated, with exposed edges folded back to form hems.
4. Conceal fasteners and expansion provisions where possible. Exposed fasteners are not allowed on faces exposed to view.

B. Fabrication Tolerances: Fabricate sheet metal flashing and trim that is capable of installation to a tolerance of 1/4 inch in 20 feet (6 mm in 6 m) on slope and location lines as indicated and within 1/8-inch (3-mm) offset of adjoining faces and of alignment of matching profiles.

C. Fabrication Tolerances: Fabricate sheet metal flashing and trim that is capable of installation to tolerances specified in MCA's "Guide Specification for Residential Metal Roofing."

D. Sealed Joints: Form non-expansion but movable joints in metal to accommodate elastomeric sealant.

E. Expansion Provisions: Where lapped expansion provisions cannot be used, form expansion joints of intermeshing hooked flanges, not less than 1 inch (25 mm) deep, filled with butyl sealant concealed within joints.

F. Fabricate continuous cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal.

G. Fabricate continuous cleats and attachment devices of sizes as recommended by SMACNA's "Architectural Sheet Metal Manual" and by FMG Loss Prevention Data Sheet 1-49 for application. Cleats shall be a minimum one gauge thicker than metal supported or as indicated by ANSI/SPRI ES-1 testing.

H. Seams: Fabricate nonmoving seams with flat-lock seams. Tin edges to be seamed, form seams, and solder.

I. Seams: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with elastomeric sealant unless otherwise recommended by sealant manufacturer for intended use. Blind-rivet joints for strength.

J. Seams for Aluminum: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with epoxy seam sealer. Blind-rivet joints for strength.

K. Do not use graphite pencils to mark metal surfaces.

L. Install continuous sheet metal and membrane through-wall flashings below all masonry copings.

2.6 ROOF DRAINAGE SHEET METAL FABRICATIONS

A. Downspouts and Gutters: Fabricate rectangular downspouts complete with mitered elbows. Furnish with metal hangers, from same material as downspouts, and anchors.

1. Fabricated Hanger Style: SMACNA figure designation 1-35A.
2. Fabricate from the following materials:
   a. Aluminum: 0.024 inch (0.61 mm), Clear anodized.

2.7 WALL SHEET METAL FABRICATIONS

A. Through-Wall Flashing: Fabricate continuous flashings in minimum 96-inch- (2400-mm-) long, but not exceeding 12-foot- (3.6-m-) long, sections, under copings, at shelf angles, and where indicated. Fabricate discontinuous lintel, sill, and similar flashings to extend 6 inches (150 mm) beyond each side of wall openings. Form with 2-inch- (50-mm-) high, end dams where flashing is discontinuous. Fabricate from the following materials:
1. Stainless Steel: 0.025 inch thick at concealed areas.
2. Clear anodized: 0.040 inch thick at exposed areas.

2.8 MISCELLANEOUS SHEET METAL FABRICATIONS

A. Equipment Support Flashing: Fabricate from the following materials:
1. Stainless Steel: 0.025 inch thick.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, to verify actual locations, dimensions and other conditions affecting performance of the Work.

1. Verify compliance with requirements for installation tolerances of substrates.
2. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and securely anchored.

B. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 UNDERLAYMENT INSTALLATION

A. General: Install underlayment as indicated on Drawings, and as required by manufacturer.

B. Self-Adhering Sheet Underlayment: Install self-adhering sheet underlayment, wrinkle free. Apply primer if required by underlayment manufacturer. Comply with temperature restrictions of underlayment manufacturer for installation; use primer rather than nails for installing underlayment at low temperatures. Apply in shingle fashion to shed water, with end laps of not less than 6 inches (150 mm) staggered 24 inches (600 mm) between courses. Overlap side edges not less than 3-1/2 inches (90 mm). Roll laps with roller. Cover underlayment within 14 days.

3.3 INSTALLATION, GENERAL

A. General: Anchor sheet metal flashing and trim and other components of the Work securely in place, with provisions for thermal and structural movement. Use fasteners, solder, welding rods, protective coatings, separators, sealants, and other miscellaneous items as required to complete sheet metal flashing and trim system.

1. Install sheet metal flashing and trim true to line and levels indicated. Provide uniform, neat seams with minimum exposure of solder, welds, and sealant.
2. Install sheet metal flashing and trim to fit substrates and to result in watertight performance. Verify shapes and dimensions of surfaces to be covered before fabricating sheet metal.
3. Provide continuous cleats anchored (2” from each end and maximum 12” o.c,) or closer per requirements of the tested assembly to meet wind uplift requirements.
4. Install exposed sheet metal flashing and trim without excessive oil canning, buckling, and tool marks.
5. Install sealant tape where indicated.
6. Torch cutting of sheet metal flashing and trim is not permitted.
7. Do not use graphite pencils to mark metal surfaces.

B. Metal Protection: Where dissimilar metals will contact each other or corrosive substrates, protect against galvanic action by painting contact surfaces with bituminous coating or by other permanent separation as recommended by SMACNA.

1. Coat back side of uncoated aluminum and stainless-steel sheet metal flashing and trim with bituminous coating where flashing and trim will contact wood, ferrous metal, or cementitious construction.
2. Underlayment: Where installing metal flashing directly on cementitious or wood substrates, install a course of felt underlayment and cover with a slip sheet or install a course of polyethylene sheet.

C. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at a maximum of 10 feet (3 m) with no joints allowed within 24 inches (600 mm) of corner or intersection. Where lapped expansion provisions cannot be used or would not be sufficiently watertight, form expansion joints of intermeshing hooked flanges, not less than 1 inch (25 mm) deep, filled with sealant concealed within joints.

D. Fastener Sizes: Use fasteners of sizes that will penetrate metal decking not less than recommended by fastener manufacturer to achieve maximum pull-out resistance.

E. Seal joints as shown and as required for watertight construction.

1. Where sealant-filled joints are used, embed hooked flanges of joint members not less than 1 inch (25 mm) into sealant. Form joints to completely conceal sealant. When ambient temperature at time of installation is moderate, between 40 and 70 deg F (4 and 21 deg C), set joint members for 50 percent movement each way. Adjust setting proportionately for installation at higher ambient temperatures. Do not install sealant-type joints at temperatures below 40 deg F (4 deg C).
2. Prepare joints and apply sealants to comply with requirements in Division 07 Section "Joint Sealants."

F. Soldered Joints: Clean surfaces to be soldered, removing oils and foreign matter. Pre-tin edges of sheets to be soldered to a width of 1-1/2 inches (38 mm), except reduce pre-tinning where pre-tinned surface would show in completed Work.

1. Do not solder aluminum sheet.
2. Do not use torches for soldering. Heat surfaces to receive solder and flow solder into joint. Fill joint completely. Completely remove flux and spatter from exposed surfaces.
3. Stainless-Steel Soldering: Tin edges of uncoated sheets using solder recommended for stainless steel and acid flux. Promptly remove acid flux residue from metal after tinning and soldering. Comply with solder manufacturer's recommended methods for cleaning and neutralization.

G. Rivets: Blind-rivet joints in aluminum for strength.

3.4 ROOF DRAINAGE SYSTEM INSTALLATION

A. General: Install sheet metal roof drainage items to produce complete roof drainage system according to SMACNA recommendations and as indicated. Coordinate installation of roof perimeter flashing with installation of roof drainage system.

B. Downspouts: Join sections with 1-1/2-inch (38-mm) telescoping joints.

1. Provide hangers with fasteners designed to hold downspouts securely to walls. Locate hangers at top and bottom and at approximately 60 inches (1500 mm) o.c. in between.
2. Provide elbows at base of downspout to direct water away from building.
3. Connect downspouts to underground drainage system indicated.

C. Splash Pans: Install where downspouts discharge on low-slope roofs. Fasten splash pan to down spout.

D. Parapet Scuppers: Install scuppers where indicated through parapet. Continuously support scupper, set to correct elevation, and seal flanges to interior wall face, over cants or tapered edge strips, and under roofing membrane.

E. Anchor scupper closure trim flange to exterior wall and seal with elastomeric sealant to scupper.

3.5 ROOF FLASHING INSTALLATION

A. General: Install sheet metal flashing and trim to comply with performance requirements, sheet metal manufacturer's written installation instructions, and SMACNA's "Architectural Sheet Metal Manual." Provide concealed fasteners where possible, set units true to line, and level as indicated. Install work with laps, joints, and seams that will be permanently watertight and weather resistant.

B. Roof Edge Flashing: Anchor to resist uplift and outward forces according to recommendations in FMG Loss Prevention Data Sheet 1-49 and ANSI/SPRI ES-1 tested for specified wind zone and as indicated. Interlock bottom edge of roof edge flashing with continuous cleat anchored to substrate at 16-inch (400-mm) centers.

C. Copings: Anchor to resist uplift and outward forces according to recommendations in FMG Loss Prevention Data Sheet 1-49 and ANSI/SPRI ES-1 tested for specified wind zone and as indicated.

1. Interlock exterior bottom edge of coping with continuous cleat anchored to substrate at 12-inch centers max. or per tested assembly.
2. Anchor interior leg of coping with screw fasteners and washers at 18-inch centers max. or per tested assembly requirements.

D. Pipe or Post Counterflashing: Install counterflashing umbrella with close-fitting collar with top edge flared for elastomeric sealant, extending a minimum of 4 inches (100 mm) over base flashing. Install stainless-steel draw band and tighten.

E. Counterflashing: Coordinate installation of counterflashing with installation of base flashing. Insert counterflashing in reglets or receivers and fit tightly to base flashing. Extend counterflashing 4 inches (100 mm) over base flashing. Lap counterflashing joints a minimum of 4 inches (100 mm) and bed with sealant. Secure in a waterproof manner by means of snap-in installation and sealant or lead wedges and sealant.

F. Roof-Penetration Flashing: Coordinate installation of roof-penetration flashing with installation of roofing and other items penetrating roof. Seal with elastomeric sealant and clamp flashing to pipes that penetrate roof.

3.6 WALL FLASHING INSTALLATION

A. General: Install sheet metal wall flashing to intercept and exclude penetrating moisture according to SMACNA recommendations and as indicated. Coordinate installation of wall flashing with installation of wall-opening components such as windows, doors, and louvers.

B. Through-Wall Flashing: Installation of through-wall flashing is specified in Division 04 Section "Face Brick and Stone Masonry."

3.7 MISCELLANEOUS FLASHING INSTALLATION

A. Overhead-Piping Safety Pans: Suspend pans independent from structure above as indicated on Drawings. Pipe and install drain line to plumbing waste or drainage system.

B. Equipment Support Flashing: Coordinate installation of equipment support flashing with installation of roofing and equipment. Weld or seal flashing with elastomeric sealant to equipment support member.

3.8 ERECTION TOLERANCES

A. Installation Tolerances: Shim and align sheet metal flashing and trim within installed tolerance of 1/4 inch in 20 feet (6 mm in 6 m) on slope and location lines as indicated and within 1/8-inch (3-mm) offset of adjoining faces and of alignment of matching profiles.

B. Installation Tolerances: Shim and align sheet metal flashing and trim within installed tolerances specified in MCA's "Guide Specification for Residential Metal Roofing."

3.9 CLEANING AND PROTECTION

A. Clean exposed metal surfaces of substances that interfere with uniform oxidation and weathering.

B. Clean and neutralize flux materials. Clean off excess solder.

C. Clean off excess sealants.

D. Remove temporary protective coverings and strippable films as sheet metal flashing and trim are installed unless otherwise indicated in manufacturers written installation instructions. On completion of installation, remove unused materials and clean finished surfaces. Maintain in a clean condition during construction.

E. Replace sheet metal flashing and trim that have been damaged or that have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION 076200

SECTION 079200 - JOINT SEALANTS

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:

1. Silicone joint sealants.
2. Urethane joint sealants.
3. **Seal all joints in the exterior envelope as required to provide a waterproof assembly. Seal all slab penetrations and at perimeters as required to keep water from passing from one floor down to the next level.**

B. Related Sections:

1. Division 04 Section "Brick Masonry" for masonry control and expansion joint fillers.
2. Division 07 Section “Air and Moisture Barrier Coatings”
3. Division 07 Section “Sheet Metal Flashings and Trim
4. Division 08 Section "Entrances and Storefronts".
5. Division 09 Section "Painting" for CMU walls.
6. Division 32 Section "Concrete Paving Joint Sealants" for sealing joints in pavements, walkways, and curbing.

1.3 PRECONSTRUCTION COMPATIBILITY, ADHESION AND STAIN TESTING

A. Preconstruction Stain, Compatibility and Adhesion Testing: Submit to joint sealant manufacturer for testing indicated below project specific sample materials.

1. Use ASTM C 1087 and/or manufacturer's standard test method to determine whether priming and other specific joint preparation techniques are required to obtain rapid, optimum adhesion of joint sealants to joint substrates.
2. Submit not fewer than **eight** pieces of each kind of material, including joint substrates, shims, joint-sealant backings, secondary seals, and miscellaneous materials.
3. Schedule sufficient time for testing and analyzing results to prevent delaying the Work.
4. For materials failing tests, obtain joint-sealant manufacturer's written instructions for corrective measures including use of specially formulated primers.

B. Construction Field-Adhesion Testing: Before installing sealants, field test their adhesion to Project joint substrates as follows:

1. Locate test joints where indicated on Project or, if not indicated, as directed by Architect.
2. Conduct field tests for each application indicated below:

   a. Each kind of sealant and joint substrate indicated.

3. Notify Architect seven days in advance of dates and times when test joints will be erected.
4. Arrange for tests to take place with joint-sealant manufacturer's technical representative present.

   a. Test Method: Test joint sealants according to Method A, Field-Applied Sealant Joint Hand Pull Tab, in Appendix X1 in ASTM C 1193 or Method A, Tail Procedure, in ASTM C 1521.

      1) For joints with dissimilar substrates, verify adhesion to each substrate separately; extend cut along one side, verifying adhesion to opposite side. Repeat procedure for opposite side.

5. Report whether sealant failed to adhere to joint substrates or tore cohesively. Include data on pull distance used to test each kind of product and joint substrate. For sealants that fail adhesively, retest until satisfactory adhesion is obtained.
6. Evaluation of Preconstruction Field-Adhesion-Test Results: Sealants not evidencing adhesive failure from testing, in absence of other indications of noncompliance with requirements, will be considered satisfactory. Do not use sealants that fail to adhere to joint substrates during testing.

1.4 ACTION SUBMITTALS

A. Product Data: For each joint-sealant product indicated.

B. Samples for Initial Selection: Manufacturer's color charts consisting of strips of cured sealants showing the full range of colors available for each product exposed to view.

C. Samples for Verification: For each kind and color of joint sealant required, provide Samples with joint sealants in 1/2-inch- (13-mm-) wide joints formed between two 6-inch- (150-mm-) long strips of material matching the appearance of exposed surfaces adjacent to joint sealants.

D. Joint-Sealant Schedule: Include the following information:

1. Joint-sealant application, joint location, and designation.
2. Joint-sealant manufacturer and product name.
3. Joint-sealant formulation.
4. Joint-sealant color.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified Installer and testing agency.

B. Product Certificates: For each kind of joint sealant and accessory, from manufacturer.

C. Sealant, Waterproofing, and Restoration Institute (SWRI) Validation Certificate: For each sealant specified to be validated by SWRI's Sealant Validation Program.

D. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, indicating that sealants comply with requirements.

E. Preconstruction Compatibility and Adhesion Test Reports: From sealant manufacturer, indicating the following:

1. Materials forming joint substrates and joint-sealant backings have been tested for compatibility and adhesion with joint sealants.
2. Interpretation of test results and written recommendations for primers and substrate preparation needed for adhesion.

F. Construction Field-Adhesion Test Reports: Indicate which sealants and joint preparation methods resulted in optimum adhesion to joint substrates based on testing specified in "Preconstruction Testing" Article.

G. Field-Adhesion Test Reports: For each sealant application tested.

H. Warranties: Sample of special warranties.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for installation of units required for this Project.

B. Source Limitations: Obtain each kind of joint sealant from single source from single manufacturer.

C. Product Testing: Test joint sealants using a qualified testing agency.

1. Testing Agency Qualifications: An independent testing agency qualified according to ASTM C 1021 to conduct the testing indicated.
2. Test according to SWRI's Sealant Validation Program for compliance with requirements specified by reference to ASTM C 920 for adhesion and cohesion under cyclic movement, adhesion-in-peel, and indentation hardness.

D. Mockups: Install sealant in mockups of assemblies specified in other Sections that are indicated to receive joint sealants specified in this Section. Use materials and installation methods specified in this Section.

E. Preinstallation Conference: Conduct conference at Project site.

1.7 PROJECT CONDITIONS

A. Do not proceed with installation of joint sealants under the following conditions:

1. When ambient and substrate temperature conditions are outside limits permitted by joint-sealant manufacturer or are below 40 deg F (5 deg C).
2. When joint substrates are wet.
3. Where joint widths are less than those allowed by joint-sealant manufacturer for applications indicated.
4. Where contaminants capable of interfering with adhesion have not yet been removed from joint substrates.

1.8 WARRANTY

A. Special Installer's Warranty: Manufacturer's standard form in which Installer agrees to repair or replace joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.

1. Warranty Period: **Three** years from date of Substantial Completion.

B. Special Manufacturer's Warranty: Manufacturer's standard form in which joint-sealant manufacturer agrees to furnish joint sealants to repair or replace those that do not comply with performance and other requirements specified in this Section within specified warranty period. Testing and log books on the joint sealant will be required for the warranty.

1. Warranty Period: 20 years from date of Substantial Completion for exterior silicone sealants.

C. Special warranties specified in this article exclude deterioration or failure of joint sealants from the following:

1. Movement of the structure caused by structural settlement or errors attributable to design or construction resulting in stresses on the sealant exceeding sealant manufacturer's written specifications for sealant elongation and compression.
2. Disintegration of joint substrates from natural causes exceeding design specifications.
3. Mechanical damage caused by individuals, tools, or other outside agents.
4. Changes in sealant appearance caused by accumulation of dirt or other atmospheric contaminants.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

A. Compatibility: Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by joint-sealant manufacturer, based on testing and field experience.

B. Liquid-Applied Joint Sealants: Comply with ASTM C 920 and other requirements indicated for each liquid-applied joint sealant specified, including those referencing ASTM C 920 classifications for type, grade, class, and uses related to exposure and joint substrates.

1. Suitability for Immersion in Liquids. Where sealants are indicated for Use I for joints that will be continuously immersed in liquids, provide products that have undergone testing according to ASTM C 1247. Liquid used for testing sealants is deionized water, unless otherwise indicated.

C. Stain-Test-Response Characteristics: Where sealants are specified to be nonstaining to porous substrates, provide products that have undergone testing according to ASTM C 1248 and have not stained porous joint substrates indicated for Project. Stain testing with project specific material shall be included as part of manufacturer's preconstruction test protocol.

D. Suitability for Contact with Food: Where sealants are indicated for joints that will come in repeated contact with food, provide products that comply with 21 CFR 177.2600.

E. Colors of Exposed Joint Sealants: As selected by Architect from manufacturer's full range of standard colors.

2.2 SILICONE JOINT SEALANTS (Use only silicone sealants in exterior envelope construction)

A. Single-Component, Nonsag, Neutral-Curing Silicone Joint Sealant: ASTM C 920, Type S, Grade NS, Class 50, for Use NT.

1. Products: Subject to compliance with requirements, provide one of the following:
   a. Dow Corning Corporation; 795 or 756SMS.
   b. Tremco: Spectrem 2 or 3.
   c. Pecora: 864NST
   d. GE Advanced Materials - Silicones; SilPruf NB SCS9000, SilPruf SCS2000, UltraPruf II SCS2900.

B. Mildew-Resistant, Single-Component, Acid-Curing Silicone Joint Sealant (Interior Use Only): ASTM C 920, Type S, Grade NS, Class 25, for Use NT.

1. Products: Subject to compliance with requirements, provide one of the following:
   a. Dow Corning Corporation; 786 Mildew Resistant.
   b. GE Advanced Materials - Silicones; Sanitary SCS1700.

2.3 URETHANE JOINT SEALANTS

A. Single-Component, Nonsag, Traffic-Grade, Urethane Joint Sealant: ASTM C 920. Type S, Grade NS, Class 25, for Use T.

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 Building Systems; Sonolastic NP1, Sonolastic Ultra.
b. May National Associates, Inc.; Bondaflex PUR 40 FC.
c. Pacific Polymers International, Inc.; Elasto-Thane 230 Type II.
d. Sika Corporation, Construction Products Division; Sikaflex - 1a.
e. Tremco Incorporated; Vulkem 116.

B. Single-Component, Pourable, Traffic-Grade, Urethane Joint Sealant: ASTM C 920, Type S, Grade P, Class 25, for Use T.

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 Building Systems; Sonolastic SL 1.
b. Bostik, Inc.; Chem-Calk 950.
c. May National Associates, Inc.; Bondaflex PUR 35 SL.
d. Pecora Corporation; Urexpan NR-201.
e. Polymeric Systems, Inc.; Flexiprene 952.
f. Schnee-Morehead, Inc.; Permathane SM7101.
g. Sika Corporation. Construction Products Division; Sikaflex - 1CSL.
h. Tremco Incorporated; Vulkem 45.

C. Immersible, Single-Component, Nonsag, Traffic-Grade, Urethane Joint Sealant: ASTM C 920, Type S, Grade NS, Class 25, for Uses T and I.

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 Building Systems; Sonolastic NP1.
b. Sika Corporation, Construction Products Division; Sikaflex - 1a.
c. Tremco Incorporated; Vulkem 116.

2.4 JOINT SEALANT BACKING

A. General: Provide sealant backings of material that are nonstaining; are compatible with joint substrates, sealants, primers, and other joint fillers; and are approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.

B. Cylindrical Sealant Backings: ASTM C 1330, Type C (closed-cell material with a surface skin), Type O (open-cell material), Type B (bicellular material with a surface skin), or any of the preceding types, as approved in writing by joint-sealant manufacturer for joint application

indicated, and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance.

C. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint-filler materials or joint surfaces at back of joint. Provide self-adhesive tape where applicable.

2.5 MISCELLANEOUS MATERIALS

A. Primer: Material recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.

B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming joint substrates and adjacent nonporous surfaces in any way, and formulated to promote optimum adhesion of sealants to joint substrates.

C. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting joint-sealant performance.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions and the following requirements:

1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.
2. Clean porous joint substrate surfaces by brushing, grinding, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining after cleaning operations above by vacuuming or blowing out joints with oil-free compressed air. Porous joint substrates include the following:

a. Concrete.
b. Masonry.
c. Unglazed surfaces of ceramic tile.

3. Remove laitance and form-release agents from concrete.
4. Clean nonporous joint substrate surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants. Nonporous joint substrates include the following:

a. Metal.
b. Glass.
c. Porcelain enamel.
d. Glazed surfaces of ceramic tile.

B. Joint Priming: Prime joint substrates where recommended by joint-sealant manufacturer or as indicated by preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.

C. Masking Tape: Use masking tape where required to prevent contact of sealant or primer with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

3.3 INSTALLATION OF JOINT SEALANTS

A. General: Comply with joint-sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.

B. Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.

C. Install sealant backings of kind indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.

1. Do not leave gaps between ends of sealant backings.
2. Do not stretch, twist, puncture, or tear sealant backings.
3. Remove absorbent sealant backings that have become wet before sealant application and replace them with dry materials.

D. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.

E. Install sealants using proven techniques that comply with the following and at the same time backings are installed:

1. Place sealants so they directly contact and fully wet joint substrates.
2. Completely fill recesses in each joint configuration.

3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.

F. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified in subparagraphs below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.

1. Remove excess sealant from surfaces adjacent to joints.
2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
3. Provide concave joint profile per Figure 8A in ASTM C 1193, unless otherwise indicated.
4. Provide flush joint profile where indicated per Figure 8B in ASTM C 1193.
5. Provide recessed joint configuration of recess depth and at locations indicated per Figure 8C in ASTM C 1193.

a. Use masking tape to protect surfaces adjacent to recessed tooled joints.

3.4 FIELD QUALITY CONTROL

A. Field-Adhesion Testing: Field test joint-sealant adhesion to joint substrates as follows:

1. Extent of Testing: Test completed and cured sealant joints as follows:

a. Perform 10 tests for the first 500 feet (150 m) of joint length for each kind of sealant and joint substrate.
b. Perform 1 test for each 500 feet (150 m) of joint length thereafter or 1 test per each floor per elevation.

2. Test Method: Test joint sealants according to Method A, Field-Applied Sealant Joint Hand Pull Tab, in Appendix X1 in ASTM C 1193 or Method A, Tail Procedure, in ASTM C 1521.

a. For joints with dissimilar substrates, verify adhesion to each substrate separately; extend cut along one side, verifying adhesion to opposite side. Repeat procedure for opposite side.

3. Inspect tested joints and report on the following:

a. Whether sealants filled joint cavities and are free of voids.
b. Whether sealant dimensions and configurations comply with specified requirements.
c. Whether sealants in joints connected to pulled-out portion failed to adhere to joint substrates or tore cohesively. Include data on pull distance used to test each kind of product and joint substrate. Compare these results to determine if adhesion passes sealant manufacturer's field-adhesion hand-pull test criteria.

4. Record test results in a field-adhesion-test log. Include dates when sealants were installed, names of persons who installed sealants, test dates, test locations, whether joints were primed, adhesion results and percent elongations, sealant fill, sealant configuration, and sealant dimensions.
5. Repair sealants pulled from test area by applying new sealants following same procedures used originally to seal joints. Ensure that original sealant surfaces are clean and that new sealant contacts original sealant.

B. Evaluation of Field-Adhesion Test Results: Sealants not evidencing adhesive failure from testing or noncompliance with other indicated requirements will be considered satisfactory. Remove sealants that fail to adhere to joint substrates during testing or to comply with other requirements. Retest failed applications until test results prove sealants comply with indicated requirements. Tests shall be performed or witnessed by sealant manufacturer's technical representative.

3.5 CLEANING

A. Clean off excess sealant or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

3.6 PROTECTION

A. Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from original work.

3.7 JOINT-SEALANT SCHEDULE

A. Polyurethane Joint-Sealant Application: Exterior joints in horizontal traffic surfaces.

1. Joint Locations:

   a. Control and expansion joints in brick pavers.
   b. Isolation and contraction joints in cast-in-place concrete slabs.
   c. Joints between plant-precast architectural concrete paving units.
   d. Joints in stone paving units.
   e. Tile control and expansion joints.
   f. Joints between different materials listed above.

B. Silicone Joint-Sealant Application: Exterior joints in vertical surfaces and horizontal nontraffic surfaces

1. Joint Locations:
   a. Control and expansion joints in brick masonry.

b. Joints in dimension stone cladding.
c. Joints between metal panels, and sheet metal flashing.
d. Joints between different materials listed above.
e. Perimeter joints between materials listed above and frames of doors, windows, and louvers.
f. All joints in exterior envelope assembly as required to provide waterproof construction.

2. Joint-Sealant Color: As selected by Architect from manufacturer's full range of standard and semi-standard colors.

C. Interior Silicone Joint-Sealant Application: Mildew-resistant interior joints in vertical surfaces and horizontal nontraffic surfaces

1. Joint Sealant Location:

a. Joints between plumbing fixtures and adjoining walls, floors, and counters.
b. Tile control and expansion joints where indicated.

2. Joint Sealant: Mildew resistant, single component, nonsag, neutral curing, Silicone.
3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.

END OF SECTION 079200

SECTION 08 16 13 - FIBERGLASS DOORS & FRAMES

PART 1 - GENERAL

1.01 SCOPE AND DEFINITIONS

A. Furnish and install doors, frames of FRP composite construction in accordance with details and schedule shown on the project drawings and as specified herein. Door and frame products of aluminum, steel or wood constructions that use FRP face sheets are strictly excluded.

B. FRP is defined as "Fiberglass Reinforced Polyester"

1.2. RELATED SECTIONS

A. Section 04 00 00: Masonry mortar

B. Section 05 50 00: Steel lintels

C. Section 06 20 00: Finish Carpentry

D. Section 08 14 00: Wood Doors

E. Section 08 70 00: Hardware

F. Section 08 80 00: Glazing

1.03 QUALITY ASSURANCE

A. Referenced Standards
1. American Society for Testing and Materials (ASTM)
2. Society of Automotive Engineers (SAE)
3. International Building Code, Plastics (Chapter 26)
4. UL Standards for Safety UL10B / UL10C, UBC 7-2
5. ANSI A250.4 1,000,000 cycle test

B. Experience: Manufacturer shall be ISO 9001 certified and been engaged in the manufacture of FRP door and frame systems for a minimum of five (5) years documented experience prior to the start of this work, and who has a history of successful production acceptable to the Architect.

C. Referenced Standard: Where labeled fire doors are required, Fiberglass Doors and frames shall be UL listed and shall be tested successfully to UL10B / UL10C, UBC 7-2 standards.

D. Process: Certify that FRP doors are manufactured via press-molding technology.

E. Warranty: Provide written limited guarantee for FRP doors and frames as follows:
1. Extreme Duty Hurricane doors are guaranteed for the life of the product against delamination

and failure due to corrosion from the specific chemical environment named at the time of purchase. Furthermore, all products are inspected prior to shipment and guaranteed against defective workmanship for a period of ten (10) calendar years after the date of purchase.

1.04 SUBMITTALS

A. Product Data: Provide catalog cut of FRP door detailing internal construction and reinforcements, materials used and description of molding process.

B. Shop Drawings: To include the following specific information:

1. Specifications relating to FRP door thickness, resin type, core material, method of construction, finish color, type of glass and glazing, anchor systems, joint construction and complete warranty information.
2. Complete schedules or drawings of FRP doors and frames (and associated Builders Hardware) showing identifying mark numbers, door and frame types, typical elevations, nominal sizes, handing, actual dimensions and clearances, and required hardware preps and reinforcements.
3. Supporting reference drawings pertaining to frame mounting details, door light or louver installation, hardware locations, and factory hardware cutouts and reinforcements.

C. Color Samples: Provide a complete set of available finish colors from the manufacturer for color selection upon request.

D. Installation instructions: Include manufacturer's specific information describing procedures, sequence and required fasteners for frame and door installation.

E. Production of FRP doors and frames shall not proceed until final approval of submittals and all necessary manufacturing information is received from customer.

1.05 DELIVERY, STORAGE AND HANDLING

A. FRP doors and frames are to be delivered to jobsite in adequate crating with foam sheet separations between all components.

B. Upon receipt of shipment, remove and inspect the doors and frames for damage. Note any damage on the shipping papers prior to accepting. If there is any noted (visible or concealed) damage, notify Tiger Door at 1-888-891-4416, immediately.

C. Handling and storage of the doors and frames after receipt is the responsibility/liability of the customer. It is recommended that the doors be stored indoors in a vertical position, clear of the floor, with blocking between the doors to permit air circulation between the doors and prevent damage to the door faces. Rain/water or condensation must not be allowed to collect or lay between stored doors. Do not wrap in plastic sheeting as it will promote condensation formation within. Permanent discoloration can result. Failure to comply with the receiving and reporting instructions shall void the Tiger Door warranty.

D. Use care in handling FRP doors and frames to prevent damage to factory finishes. Wear protective gloves and do not slide or drag doors or frames against one another.

PART 2 - PRODUCTS

2.01 Manufacturer

A. FRP Doors and Frames shall be as manufactured by Tiger Door, 1181 Garden Street Greensburg, PA 15601. ph 724-832-4416 toll-free 888-891-4416, fax 724-837 3759- www.tigerdoor.com.

2.02 FRP DOORS

A. Hurricane Rated FRP Doors
1. Design: FRP doors shall be of seamless press-molded construction. Laminated FRP face sheets shall be applied while wet and uncured to an internal door stile and rail subframe/core assembly and then press- molded under heat and pressure. The composite door panel must be integrally fused over its entire surface area, not just adhesive-bonded at perimeter stiles and rails. Doors shall remain under pressure during curing for flat, warp-free surfaces.
2. Stiles & Rails: A high-modulus pultruded FRP square or rectangular tube subframe is to be provided within the door. Tubes are to be mitered and joined internally at the corners with solid polymer blocks to yield a one-piece unit that does not require any secondary external sealing. Provide a tubular midrail across width of door at lock height, and additional horizontal rails where specific design conditions dictate. Doors shall incorporate molded-in FRP edge strips, chemically bonded to the subframe stiles, for machining of hardware mortises so as not to cut or otherwise compromise the integrity of the pultruded stiles, nor allow moisture to penetrate into the core of the door. All connections shall be chemically welded. No mechanical fasteners will be allowed. The use or inclusion of aluminum, steel, gypsum or wood into stile and rail construction is not permitted.
3. Core: For maximum rigidity and compressive strength a triangular shaped 3/8” cell phenolic resin impregnated kraft paper honeycomb core shall be used. Molding pressure and resin gel time shall be sufficient to allow for penetration of resin into the cellular structure of the core to maximize shear and peel strengths at the skin/core interface and eliminate the possibility of delamination. The honeycomb is to be completely enclosed within the stile and rail subframe. Use of foam or balsa wood is not permitted.
4. Internal Reinforcement: High-modulus pultruded tubular FRP, high-density polymer compression blocks, or plastic compression blocking at all hardware locations, and corner locations. No wood blocking, steel or aluminum reinforcing plates, ribs or fittings shall be used. A minimum of 900 lbs of pullout strength is required for each factory supplied hinge screw.
5. Faces: Door facings shall utilize a chemical resistant thermosetting polyester resin system with fiber reinforcing layers. Supplier shall furnish door faces as shown on the drawings and in the door elevations. Chopped strand mat layers shall be used to provide bond integrity between gelcoat, laminated facings and the internal door structure. Structural reinforcement shall be in the form of a knitted multi-layer material with layers of uni-directional glass fiber oriented in both the vertical and horizontal directions for high stiffness, impact resistance and resistance to warping. Gelcoat surface integrally molded to be 25/30 mils thick (wet) ultra-violet light stabilized marine grade NPG-isophthalic polyester gelcoat.

6. Finish: The exposed FRP door faces shall have a 3-4 mils (wet) factory applied two-part aliphatic polyurethane fully cured coating of industrial urethane. Coating shall have a minimum hardness of H to
   2H. Finish shall be a slightly textured semi-gloss to minimize the visual effects of wear and tear.
7. Astragals: All pairs of doors shall be furnished with an astragal from door manufacturer made of same pultruded FRP material as door stile, rail and edge as required. Astragal shall be located on the meeting stile edge of each inactive leaf of double door pairs. Architect shall advise active leaf of door, and astragal shall be installed to cover meeting stile gap to effect seal and security.
8. Lights: Glass required shall be factory furnished, glazed and installed. Glass supplied shall be that as required to maintain Hurricane and Impact ratings as tested. Centered glazing shall be installed between 45 degree pultruded FRP glazing stops and vinyl foam tape with concealed compression retainers. No exposed fasteners or exposed silicone will be allowed for securing glazing. Metal, pvc, or vinyl "Glass Kit" type lights are not acceptable for hurricane rated openings.
9. Raised panels and plants: All doors shown in elevation to have raised panels or plants shall be equipped with plants in configuration as shown on plans and in door schedule. Plants shall be applied by the door manufacturer as an integral part of the door face. Plants shall be bonded to the door skin; no mechanical fasters shall be permitted. All applied moldings shall be of resin material, and shall be installed by the manufacturer to resemble a raised panel door. Field applied plants or moldings shall not be acceptable.
10. Provisions for lights and louvers shall be performed during manufacture and shall not be attempted in the field. Cutouts are to be totally enclosed by pultruded FRP stiles and rails incorporated into the door structure. Light cutouts that expose core material are not acceptable.

2.03 FRP FRAMES

A. Hurricane Rated FRP Frames:
   1. Design: FRP Door frames furnished under this specification shall utilize a high-modulus pultruded structural FRP shape. The frame section shall be standard double rabbeted 5-3/4" deep x 2" face, 3/16" thick, with integral 5/8" doorstop with 1 15/16" soffits, to match typical hollow metal configurations. Additional jamb profiles and widths are available.
   2. Corner Joints: Frame jambs and header shall be joined at corners via miter connections with hidden FRP angle clips and associated fasteners. Post and beam corners will not be acceptable. Exposed fasteners for miter connections will not be acceptable except for wrap wall applications.
   3. Hardware Reinforcements: FRP reinforcing shall be chemically welded to door frame material at required locations. Minimum screw pullout strength of 1100 lb per #12 x 1" sheet metal screw is required. Mechanically fastened reinforcements are not permitted.
   4. Anchors:
      a. BOLT-IN: Provide manufacturer's required number of 3/8" diameter x 4" long flat head stainless steel sleeve anchors for masonry openings, 3/8" diameter x 4" machine screw with nut and washers for structural steel openings, #14 x 4" stainless steel flat head sheet metal screws for wood or steel stud openings. Include extra anchors for additional frame height in two foot increments above 8'-0". Provide single bolt anchor at center of all headers over four feet in nominal width. Stainless Steel fasteners shall be furnished by the factory.
      b. GROUT-IN: Provide manufacturer's required number of wire or strap type masonry

anchors for installation into block wall. Fill frame cavity with grout.

5. Finish: Frames shall have a 3-4 mils (wet) factory applied two-part aliphatic polyurethane fully cured coating of industrial urethane. Industrial urethane chemical coating color topcoat, to match the color and sheen of the doors, for superior weatherability. Gelcoat may not be sprayed onto the frame as a secondary coating.

2.04 MECHANICAL PROPERTIES AND TEST PERFORMANCE

A. Pultruded structural shapes for stiles; rails, frames, and astragals shall exhibit the following minimum longitudinal coupon properties (per ASTM):
   1. Tensile strength (D638) 30,000 psi
   2. Comprehensive strength (D695) 30,000 psi
   3. Flexural strength (D790) 30,000 psi
   4. Flexural modulus (D790) 1,600,000 psi
   5. Shear strength (D2846) 4,500 psi
   6. Impact, notched (D256) 25 ft-lb/in
   7. Barcol hardness (D2853) 50

B. Core material shall exhibit the following minimum coupon properties (per ASTM):
   1. Core material must comply with the International Building Code (IBC) chapter 26 requirements for use with a plastic skin.
   2. Shear strength, longitudinal direction (C273) 68.2 psi
   3. Shear strength, transverse direction (C273) 25.8 psi
   4. Shear modulus, longitudinal direction (C273) 6940 psi
   5. Shear modulus, transverse direction (C273) 1878 psi
   6. Shear elongation, longitudinal direction (C393 short beam) 1.79%
   7. Shear elongation, transverse direction (C393 short beam) 2.72%
   8. Maximum facing stress, longitudinal direction (C393 short beam) 735 psi
   9. Maximum facing stress, transverse direction (C393 short beam) 289 psi
   10. Maximum core shear stress, longitudinal direction (C393 short beam) 63.8 psi
   11. Maximum core shear stress, transverse direction (C393 short beam) 24.9 psi
   12. Modulus of elasticity (EI) per 1" width, longitudinal direction (C393 short beam) 4.92E+04 psi
   13. Modulus of elasticity (EI) per 1" width, transverse direction (C393 short beam) 1.97E+04 psi
   14. Maximum facing stress, longitudinal direction (C393 long beam) 9011 psi
   15. Maximum facing stress, transverse direction (C393 long beam) 4727 psi
   16. Maximum core shear stress, longitudinal direction (C393 long beam) 48.3 psi
   17. Maximum core shear stress, transverse direction (C393 long beam) 23.5psi
   18. Modulus of elasticity (EI) per 1" width, longitudinal direction (C393 long beam) 1.14E+05 psi
   19. Modulus of elasticity (EI) per 1" width, transverse direction (C393 long beam) 7.23E+05 psi
   20. Stiffness "D", longitudinal direction (C393 long beam) 379,270 psi
   21. Stiffness "D", longitudinal direction (C393 long beam) 260,608 psi
   22. Compressive strength (C365) 53 psi
   23. Compressive modulus (C365) 2110 psi
   24. Density (C271) 2.42 lb/ft^3

C. Adhesive shall exhibit the following minimum coupon properties (per SAE)
   1. Tensile Strength (D882-83A modified) minimum 2000 psi

2. 8 day 25º C at 100% humidity Cross Peel (SAE J1553) minimum 330 psi
3. 7 day immersion in seawater Cross Peel (SAE J1553) minimum 330 psi
4. 30 day immersion in saltwater Cross Peel (SAE J1553) minimum 330 psi
5. 72 hour immersion in gasoline Cross Peel (SAE J1553) minimum 330 psi
6. 72 hour immersion in 20% sulfuric acid Cross Peel (SAE J1553) minimum 300 psi

D. ANSI A250.4 1,000,000 cycle test
1. 4' x 8' door (up to a full light) and frame successfully tested in excess of 1,000,000 cycles with no failure of any of the design features of the door or frame.

E. Doors and Frames shall exhibit the following minimum properties:
1. ASTM E 283-91(99), "Standard Test Method for Rate of Air Leakage Through Exterior Windows, Curtain Walls and Doors Under Specified Pressure Differences Across the Specimen."
2. ASTM E 331-00, "Standard Test Method for Water Penetration of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference."
3. ASTM E 330-02, Standard Test Method for Structural Performance of Exterior Window, Doors Skylights and Curtain Walls by Uniform Static Air Pressure Difference.
4. AAMA 1304-02, Voluntary Specification for Forced Entry Resistance of Side-Hinged Door Systems.
5. ASTM E1886-02, Standard Test Method for Performance of Exterior Windows, Curtain Walls, Doors and Storm Shutters Impacted by Missile(s) and Exposed to Cyclic Pressure Differentials.
6. ASTM E1996-02, Standard Specification for Performance of Exterior Windows, Curtain Walls, Doors and Storm Shutters Impacted by Windborne Debris in Hurricanes.
7. ANSI/SDI A250.13-03, Testing and Rating of Severe Windstorm Components for Swinging Door Assemblies, Section 8.2 Stiffness Classification.

2.04.1 FASTENERS

A. All fasteners for all hardware shall be type 304 CRSS (18-8 series corrosion resistant stainless steel) with no exception. No carbon steel or aluminum components shall be used.

2.04.2 HARDWARE

A. Doors shall be factory mortised and drilled for mortise template butt hinges, with #12x2" long stainless steel screws pre-installed for hinge attachment. Provide 161 cylindrical lock bore, rim deadbolt, ANSI 86 mortise lock edge prep and pocket or flush bolt cutouts as required. Hardware used must meet the hurricane ratings of the door being provided.

B. Frames shall be factory machined and drilled for all hardware requiring mortises, with #12x1" long stainless steel screws pre-installed for hinge attachment.

C. Hardware shall be furnished as listed in section 08 70 00 or as so designated in appropriate section, and shall be coordinated by GC and installed by experienced mechanics.

D. Supplier shall furnish manufacturer's standard templates, installation instructions, or full size approved door and frame preparation instructions as approved by the architect and as required by door and frame manufacturer prior to door and frame factory initiated manufacture. Standard factory lead-time for production of FRP doors and frames shall commence only and when all distributors required preparation information is received and acknowledged by the door and frame manufacturer.

PART 3 - EXECUTION

3.01 IDENTIFICATION

A. Factory mark all doors and frames using a chemical resistant plastic tag or indelible marker with identifying number, keyed to shop drawings, prior to shipment.

3.02.1 INSTALLATION

A. Frames: Install in strict accordance with manufacturer's printed instructions. Set plumb and square, using shims for bolt-in of existing openings, or wood bracing prior to grouting of jambs. Use at least two 2x6 wood spreaders inside frame to maintain critical opening dimensions during grouting.

B. Doors: Hang per manufacturer's printed instructions using special screws provided for hinge attachment. Install doors to swing freely and to stand open at any angle. After installation make final adjustments to hardware to allow for proper door operation and latching. All surface applied hardware shall be thru bolted.

3.03 CLEANING

A. Clean exposed surfaces of FRP doors and frames with a mild, non-abrasive cleaner and water.

END OF SECTION

3/2/11

SECTION 083113 - ACCESS DOORS AND FRAMES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Access doors and frames for walls and ceilings.

B. Related Requirements:
1. Division 22 Section "Plumbing ".

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details, fire ratings (if required), materials, individual components and profiles, and finishes.

B. Shop Drawings:

1. Include plans, elevations, sections, details, and attachments to other work.
2. Detail fabrication and installation of access doors and frames for each type of substrate.

C. Submittals:
1. Product Data: For products having recycled content, documentation indicating percentages by weight of postconsumer and pre-consumer recycled content. Include statement indicating cost for each product having recycled content.

D. Samples: For each door face material, at least 3 by 5 inches (75 by 125 mm) in size, in specified finish.

E. Product Schedule: Provide complete access door and frame schedule, including types, locations, sizes, latching or locking provisions, and other data pertinent to installation.

PART 2 - PRODUCTS

2.1 ACCESS DOORS AND FRAMES FOR WALLS AND CEILINGS

A. Manufacturers: Subject to compliance with requirements, provide products by the following::

1. Access Panel Solutions.
2. Acudor Products, Inc.
3. Alfab, Inc.
4. Babcock-Davis.
5. Cendrex Inc.
6. Elmdor/Stoneman Manufacturing Co.; Div. of Acorn Engineering Co.
7. Jensen Industries; Div. of Broan-Nutone, LLC.
8. J. L. Industries, Inc.; Div. of Activar Construction Products Group.
9. Karp Associates, Inc.
10. Larsen's Manufacturing Company.
11. Maxam Metal Products Limited.
12. Metropolitan Door Industries Corp.
13. MIFAB, Inc.
14. Milcor Inc.
15. Nystrom, Inc.
16. Williams Bros. Corporation of America (The).

B. Source Limitations: Obtain each type of access door and frame from single source from single manufacturer.

C. Flush Access Doors with Concealed Flanges:
1. Assembly Description: Fabricate door to fit flush to frame. Provide frame with beads for concealed flange installation.
2. Locations: Wall and ceiling.
3. Door Size: Ref. MEP and Code officials for sizes..
4. Uncoated Steel Sheet for Door: Nominal 0.060 inch (1.52 mm), 16 gage.

a. Finish: Factory prime. Field finish to match adjacent materials

5. Frame Material: Same material and thickness as door.
6. Hinges: Manufacturer's standard.
7. Hardware: Latch.

2.2 FABRICATION

A. General: Provide access door and frame assemblies manufactured as integral units ready for installation.

B. Metal Surfaces: For metal surfaces exposed to view in the completed Work, provide materials with smooth, flat surfaces without blemishes. Do not use materials with exposed pitting, seam marks, roller marks, rolled trade names, or roughness.

C. Doors and Frames: Grind exposed welds smooth and flush with adjacent surfaces. Furnish attachment devices and fasteners of type required to secure access doors to types of supports indicated.

1. For concealed flanges with drywall bead, provide edge trim for gypsum board and gypsum base securely attached to perimeter of frames.
2. For concealed flanges with plaster bead for full-bed plaster applications, provide zinc-coated expanded metal lath and exposed casing bead welded to perimeter of frames.
3. Provide mounting holes in frames for attachment of units to metal or wood framing.
4. Provide mounting holes in frame for attachment of masonry anchors.

D. Latching Mechanisms: Furnish number required to hold doors in flush, smooth plane when closed.

1. For cylinder locks, furnish two keys per lock and key all locks alike.
2. For recessed panel doors, provide access sleeves for each locking device. Furnish plastic grommets and install in holes cut through finish.

2.3 FINISHES

A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

C. 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.

D. Steel and Metallic-Coated-Steel Finishes:

1. Factory Prime: Apply manufacturer's standard, fast-curing, lead- and chromate-free, universal primer immediately after surface preparation and pretreatment.
2. Factory Finish: Immediately after cleaning and pretreating, apply manufacturer's standard two-coat, baked-on finish consisting of prime coat and thermosetting topcoat, with a minimum dry-film thickness of 1 mil (0.025 mm) for topcoat.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Comply with manufacturer's written instructions for installing access doors and frames.

B. Install doors flush with adjacent finish surfaces or recessed to receive finish material.

3.3 ADJUSTING

A. Adjust doors and hardware, after installation, for proper operation.

B. Remove and replace doors and frames that are warped, bowed, or otherwise damaged.

END OF SECTION 083113

SECTION 083323 - OVERHEAD COILING DOOR

PART 1 - GENERAL

1.1 RELATED WORK:

A. Related Documents: Drawings of Specifications, including General and Supplementary Conditions and Division 1 Specification Sections, apply to the Work specified in this Section. Include both insulated and non-insulted service doors as noted on drawings.

B. Related Work of Other Sections: Coordinate the work of this Section with the Work of other Sections as required to properly execute the Work and as necessary to maintain satisfactory progress of the Work of other Sections. Other Sections containing related work include but are not limited to the following:

1. Section 042200 – Concrete Unit Masonry.
2. Section 042113 – Brick Veneer.

1.2 GENERAL DESCRIPTION OF THE WORK OF THIS SECTION:

A. Provide chain operated overhead coiling door w/ chain hoist in Storage Area in accordance with Contract Documents. Reference door schedule and plans.

1.3 REFERENCES:

A. Except as modified by governing codes and by Contract Documents, comply with applicable provisions and recommendations of the following:

1. AWS "Structural Welding Code".
2. SSPC-SP "Structural Steel Painting Council - Surface Painting".

1.5 SUBMITTALS:

A. General: Submit the following in accordance with Section 01300 - Submittals.

B. Product Data:

1. Coiling Doors.

C. Shop Drawings:

1. Coiling Doors: Provide layout drawings at minimum 1/2" = 1'- 0" and details at minimum 1 1/2"= 1'- 0" which indicate type of materials, size and arrangement of component parts, adjacent construction, methods of installation, and other pertinent data. PE shall sign and seal all shop drawings.

1.6 DELIVERY, STORAGE AND HANDLING:

A. Delivery of Materials: Deliver materials in manufacturer's unopened containers fully identified with manufacturer's name, trade name, type, class, grade, size and color.

B. Storage of Materials: Deliver materials in unopened containers. Store off ground and under cover, protected from damage.

C. Handling of Materials: Handle materials so surfaces are protected. Prevent distortion of, and other damage to, fabricated pieces.

1.7 PERFORMANCE REQUIREMENTS

A. Delegated Design: Design overhead coiling doors, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated. PE shall be registered in the state where the project is being constructed. Submit PE sealed calculations with project data.

B. Structural Performance, Exterior Doors: Exterior overhead coiling doors shall withstand the wind loads, the effects of gravity loads, and loads and stresses within limits and under conditions indicated according to SEI/ASCE 7.

1. Wind Loads:
   Basic Wind Speed: 155 mph.
   Importance Factor: 1.15.
   Exposure Category: B.
2. Deflection Limits: Design overhead coiling doors to withstand design wind load without evidencing permanent deformation or disengagement of door components.
3. Operability under Wind Load: Design overhead coiling doors to remain operable under uniform pressure (velocity pressure) of 20 lbf/sq. ft. (960 Pa) wind load, acting inward and outward.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS:

A. Provide roll-up doors manufactured for Service Areas by one of the following:

1. Atlas Roll-lite
2. CECO/Windsor Door Co.
3. Cornell Iron Works, Inc.
4. Overhead Door Company of Houston
5. Overhead Door Company of Austin
6. Owner approved equivalent.

2.2 MATERIALS:

A. Steel Door Curtain Slats: ASTM A446, Grade A, cold-rolled, structural quality with 1.25 ounce "Commercial" zinc coating and phosphate treated before fabrication.

B. Sheet Steel: ASTM A525, galvanized with 1.25 ounce "Commercial" zinc coating and phosphate treated before fabrication.

C. Structural Steel Shapes: ASTM A36.

D. Aluminum: Suitable alloy and temper for extruding, fabricating and finishing as specified.

2.3 FABRICATION:

A. Coiling Doors:

1. Door Curtain: Fabricate of galvanized steel; interlocking slats of shape similar to Overhead Door Corp. “620 Series” w/ wear strips within the guides; minimum 50,000 cycles. Fabricate slats of one piece continuous length for width of door. Provide powder coat finish applied by manufacturer w/ 10 year finish warranty. Full color range.
2. Endlocks: Malleable iron castings; shape and size required for proper curtain alignment and resistance to lateral movement. Provide one on each end of alternate interlocking slats. Secure to curtain slats with minimum 2 galvanized rivets.
3. Jamb Guides: Form of standard steel angles of sufficient depth and strength to retain curtain in place.
4. Bottom Bar: Two steel angles each not less than 2" X 2" by continuous full width of door. Provide sloping bottom panel as required to properly seal against sloping floor.
5. Safety Edge: On electrically operated doors provide continuous safety edge on bottom bar capable of stopping downward movement of curtain instantly upon contact with obstruction in door opening and causing door to return to full open position.
6. Steel Hood: Fabricate of 24 gauge galvanized sheet steel. Form of rectangular sections with square corners. Enclose each end. Roll and reinforce top and bottom edges. Provide required supports to prevent sag.
7. Roller Shaft: Fabricate of steel pipe of sufficient diameter to reduce deflection not to exceed 0.03 inch per foot of span under full load. Roller shaft shall house counterbalancing mechanism including oil-tempered helicol steel spring capable of producing sufficient torque to assure easy operation of door curtain. Spring tension shall be adjustable from adjusting wheel on outside of end bracket.
8. Weather Seal: Provide vinyl or neoprene rubber weatherstripping for exterior doors. Secure weather seals with continuous metal pressure bars. Weather seal shall be continuous full height each jamb and full width of curtain within curtain coil hood.
9. Finishing: Powder coat all galvanized surfaces, exposed and unexposed, except lubricated surfaces, with Tiger Drylac Powder Coating, or approved equal.

Provide 10-year finish warranty. Color as selected by Architect from manufacturer's full range.

2.4 CHAIN HOIST DOOR OPERATION:

A. Chain Hoist: Provide manual chain hoist operator consisting of endless steel hand chain, chain pocket wheel and guard, and geared reduction unit with maximum 35 pounds pull for door operation. Design chain hoist with self-locking mechanism allowing curtain to be stopped at any point in its travel and remain in position until movement is reactivated. Furnish cadmium-plated alloy steel hand chain with chain holder secured to operator guide.

PART 3 - EXECUTION

3.1 INSPECTION:

A. Examine adjoining construction, and conditions under which work is to be installed. Do not proceed with work until unsatisfactory conditions have been corrected.

3.2 INSTALLATION:

A. Install door and operating equipment with necessary hardware, in accordance with final shop drawings, manufacturer's instructions, and as specified herein.

B. Upon completion of installation including work by other trades, test and adjust doors to operate easily, free from warp, twist or distortion.

END OF SECTION 083323

SECTION 09 67 23 - RESINOUS FLOORS

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. This Section includes one resinous flooring system which includes a penetrating two-component epoxy primer, free flowing epoxy formulation including resin, hardener and reactive flow enhancers, brightly colored, quartz silica aggregate broadcast followed by a two-component, high performance, clear epoxy sealer and then a two-component, high performance, aliphatic polyurethane coating for use as a highly UV and stain resistant coating.

B. Application Method: Squeegee, back roll, broadcast quartz aggregate

1.3 SUBMITTALS

A. Product Data: For each type of product indicated. Include manufacturer's technical data, application instructions, and recommendations for each resinous flooring component required.

B. Samples for Verification: For each resinous flooring system required, 6 inches (150 mm) square, applied to a rigid backing by Installer for this Project.

C. Product Schedule: Use resinous flooring designations indicated in Part 2 and room designations indicated on Drawings in product schedule.

D. Installer Certificates: Signed by manufacturer certifying that installers comply with specified requirements.

E. Maintenance Data: For resinous flooring to include in maintenance manuals.

1.4 QUALITY ASSURANCE

A. No request for substitution shall be considered that would change the generic type of floor system specified consisting of a minimum 2mm quartz broadcast epoxy flooring system. Equivalent materials of other manufactures may be substituted only on approval of Architect or Engineer. Request for substitution will only be considered only if submitted 10 days prior to bid date. Request will be subject to specification requirements described in this section.

B. Installer Qualifications: Engage an experienced installer (applicator) who is experienced in applying resinous flooring systems similar in material, design, and extent to those indicated for

this Project, whose work has resulted in applications with a record of successful in-service performance, and who is acceptable to resinous flooring manufacturer.

1. Engage an installer who is certified in writing by resinous flooring manufacturer as qualified to apply resinous flooring systems indicated.
2. Contractor shall have completed at least 10 projects of similar size and complexity.

C. Source Limitations: Obtain primary resinous flooring materials, including primers, resins, hardening agents, grouting coats, and topcoats, through one source from a single manufacturer, with not less than ten years of successful experience in manufacturing and installing principal materials described in this section. Provide secondary materials, including patching and fill material, joint sealant, and repair materials, of type and from source recommended by manufacturer of primary materials.

D. Manufacturer Field Technical Service Representatives: Resinous flooring manufacture shall retain the services of Field Technical Service Representatives who are trained specifically on installing the system to be used on the project.

1. Field Technical Services Representatives shall be employed by the system manufacture to assist in the quality assurance and quality control process of the installation and shall be available to perform field problem solving issues with the installer.

E. Mockups: Apply mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.

1. Apply full-thickness mockups on 48-inch- (1200-mm-) square floor area selected by Architect.

a. Include 48-inch (1200-mm) length of integral cove base.

2. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

F. Pre-installation Conference:

1. General contractor shall arrange a meeting not less than thirty days prior to starting work.

2. Attendance:

a. General Contractor

b. Architect/Owner's Representative.

c. Manufacturer/Installer's Representative.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials in original packages and containers, with seals unbroken, bearing manufacturer's labels indicating brand name and directions for storage and mixing with other components.

B. Store materials to prevent deterioration from moisture, heat, cold, direct sunlight, or other detrimental effects.

C. All materials used shall be factory pre-weighed and pre-packaged in single, easy to manage batches to eliminate on site mixing errors. No on site weighing or volumetric measurements allowed.

1.6 PROJECT CONDITIONS

A. Environmental Limitations: Comply with resinous flooring manufacturer's written instructions for substrate temperature, ambient temperature, moisture, ventilation, and other conditions affecting resinous flooring application.

1. Maintain material and substrate temperature between 65 and 85 deg F (18 and 30 deg C) during resinous flooring application and for not less than 24 hours after application.

B. Lighting: Provide permanent lighting or, if permanent lighting is not in place, simulate permanent lighting conditions during resinous flooring application.

C. Close spaces to traffic during resinous flooring application and for not less than 24 hours after application, unless manufacturer recommends a longer period.

D. Concrete substrate shall be properly cured for a minimum of 30 days. A vapor barrier must be present for concrete subfloors on or below grade. Otherwise, an osmotic pressure resistant grout must be installed prior to the resinous flooring

1.7 WARRANTY

A. Manufacturer shall furnish a single, written warranty covering both material and workmanship for a period of 2 full years from date of installation, or provide a joint and several warranty signed on a single document by material manufacturer and applicator jointly and severally warranting the materials and workmanship for a period of 2 full year from date of installation. A sample warranty letter must be included with bid package or bid may be disqualified.

PART 2 - PRODUCTS

2.1 RESINOUS FLOORING

A. Available Products: Subject to compliance with requirements of the following, epoxy flooring system is a penetrating two-component epoxy primer, free flowing epoxy formulation including resin, hardener and reactive flow enhancers, brightly colored, quartz silica aggregate broadcast followed by a two-component, high performance, clear epoxy sealer and a two-component, high performance, aliphatic polyurethane coating for use as a highly UV and stain resistant coating.

B. Acceptable Manufactures,

1. Stonhard: Basis of design, Stonshield SLT with Stonseal GS6 – contact Sean Cronin 281-253-5125 or 800-854-0310.

C. System Characteristics:

1. Color and Pattern: TBD
2. Wearing Surface: standard or medium texture as selected from manufacturer.
3. Integral Cove Base: TBD Yes
4. Overall System Thickness: 2mm

D. System Components: Manufacturer's standard components that are compatible with each other and as follows:

1. Body Coat(s):

a. Material Basis: free flowing epoxy formulation including resin, hardener and reactive flow enhancers, brightly colored, quartz silica aggregate broadcast
b. Resin: Epoxy.

2. Sealer:

a. Material Basis: Stonshield Sealer.
b. Resin: Epoxy
c. Formulation Description: 2 component, 100% solids.

3. Topcoat:

a. Material Basis: Stonseal GS6
b. Resin: UV resistant aliphatic urethane
c. Two component

2.2 ACCESSORY MATERIALS

A. Primer: Type recommended by manufacturer for substrate and body coats indicated. Formulation Description: Stonhard Stonblend Primer, 100% solids.

B. Waterproofing Membrane: Type recommended by manufacturer for substrate and primer and body coats indicated.

C. Patching and Fill Material: Resinous product of or approved by resinous flooring manufacturer and recommended by manufacturer for application indicated.

D. Joint Sealant: Type recommended or produced by resinous flooring manufacturer for type of service and joint condition indicated. Allowances should be included for Stonflex MP7 joint fill material, and or CT5 concrete crack treatment.

PART 3 - EXECUTION

3.1 PREPARATION

A. General: Prepare and clean substrates according to resinous flooring manufacturer's written instructions for substrate indicated. Provide clean, dry, and neutral Ph substrate for resinous flooring application.

B. Concrete Substrates: Provide sound concrete surfaces free of laitance, glaze, efflorescence, curing compounds, form-release agents, dust, dirt, grease, oil, and other contaminants incompatible with resinous flooring.

1. Mechanically prepare substrates as follows:

a. Shot-blast surfaces with an apparatus that abrades the concrete surface, contains the dispensed shot within the apparatus, and recirculates the shot by vacuum pickup.
b. Comply with ASTM C 811 requirements, unless manufacturer's written instructions are more stringent.

2. Repair damaged and deteriorated concrete according to resinous flooring manufacturer's written recommendations.
3. Verify that concrete substrates are dry.

a. Perform in situ probe test, ASTM F 2170. Proceed with application only after substrates do not exceed a maximum potential equilibrium relative humidity of 75 percent.
b. Perform anhydrous calcium chloride test, ASTM F 1869. Proceed with application only after substrates have maximum moisture-vapor-emission rate of 6 lb of water/1000 sq. ft. of slab in 24 hours.
c. Perform additional moisture tests recommended by manufacturer. Proceed with application only after substrates pass testing.

4. Verify that concrete substrates have neutral Ph and that resinous flooring will adhere to them. Perform tests recommended by manufacturer. Proceed with application only after substrates pass testing.

C. Resinous Materials: Mix components and prepare materials according to resinous flooring manufacturer's written instructions.

D. Use patching and fill material to fill holes and depressions in substrates according to manufacturer's written instructions.

E. Treat control joints and other nonmoving substrate cracks to prevent cracks from reflecting through resinous flooring according to manufacturer's written recommendations. Allowances should be included for Stonflex MP7 joint fill material, and CT5 concrete crack treatment.

3.2 APPLICATION

A. General: Apply components of resinous flooring system according to manufacturer's written instructions to produce a uniform, monolithic wearing surface of thickness indicated.

1. Coordinate application of components to provide optimum adhesion of resinous flooring system to substrate, and optimum intercoat adhesion.
2. Cure resinous flooring components according to manufacturer's written instructions. Prevent contamination during application and curing processes.
3. At substrate expansion and isolation joints, provide joint in resinous flooring to comply with resinous flooring manufacturer's written recommendations.

   a. Apply joint sealant to comply with manufacturer's written recommendations.

B. Apply primer where required by resinous system, over prepared substrate at manufacturer's recommended spreading rate.

A. Integral Cove Base: Stonshield cove base mortar, apply cove base mix to wall surfaces before applying flooring. Apply according to manufacturer's written instructions and details including those for taping, mixing, priming, troweling, sanding, and topcoating of cove base. Round internal and external corners.

1. Integral Cove Base: 5” high or to first CMU Joint

B. Troweled Mortar: Mix mortar material according to manufacturer's recommended procedures. Uniformly spread mortar over substrate using manufacturer's specially designed screed box adjusted to manufacturer's recommended height. Hand trowel apply mixed material over freshly primed substrate using steel finishing trowels or power trowel material using manufacturer's specially designed power trowel blades.

C. Surface irregularities. Mix and apply sealer with strict adherence to manufacturer's installation procedures.

D. Mar Resistant Finish: Lightly sand or scrape surface to remove any floor surface irregularities. Mix and roller apply mar resistant finish with strict adherence to manufacturer's installation procedures.

3.3 TERMINATIONS

A. Chase edges to “lock” the coating system into the concrete substrate along lines of termination.

B. Penetration Treatment: Lap and seal coating onto the perimeter of the penetrating item by bridging over compatible elastomer at the interface to compensate for possible movement.

C. Trenches: Continue coating system into trenches to maintain monolithic protection. Treat cold joints to assure bridging of potential cracks.

D. Treat floor drains by chasing the coating to lock in place at point of termination.

3.4 JOINTS AND CRACKS

A. Treat control joints to bridge potential cracks and to maintain monolithic protection.

B. Treat cold joints and construction joints to bridge potential cracks and to maintain monolithic protection on horizontal and vertical surfaces as well as horizontal and vertical interfaces.

C. Discontinue floor coating system at vertical and horizontal contraction and expansion joints by installing backer rod and compatible sealant after coating installation is completed. Provide sealant type recommended by manufacturer for traffic conditions and chemical exposures to be encountered.

3.5 FIELD QUALITY CONTROL

A. Material Sampling: Owner may at any time and any numbers of times during resinous flooring application require material samples for testing for compliance with requirements.

1. Owner will engage an independent testing agency to take samples of materials being used. Material samples will be taken, identified, sealed, and certified in presence of Contractor.
2. Testing agency will test samples for compliance with requirements, using applicable referenced testing procedures or, if not referenced, using testing procedures listed in manufacturer's product data.
3. If test results show applied materials do not comply with specified requirements, pay for testing, remove noncomplying materials, prepare surfaces coated with unacceptable materials, and reapply flooring materials to comply with requirements.

3.6 CLEANING, PROTECTING, AND CURING

A. Cure resinous flooring materials in compliance with manufacturer's directions, taking care to prevent contamination during stages of application and prior to completion of curing process. Close area of application for a minimum of 18 hours.

B. Protect resinous flooring materials from damage and wear during construction operation. Where temporary covering is required for this purpose, comply with manufacturer's recommendations for protective materials and method of application. General Contractor is responsible for protection and cleaning of surfaces after final coats.

C. Cleaning: Remove temporary covering and clean resinous flooring just prior to final inspection. Use cleaning materials and procedures recommended by resinous flooring manufacturer

END OF SECTION 096723

SECTION 099113 - EXTERIOR PAINTING

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 surface preparation and the application of paint systems on exterior and interior substrates:
   1. Concrete masonry units.
   2. Cement board soffits, ceilings and trim.

B. Related Requirements:

   1. Division 05 Sections for shop priming of metal substrates with primers specified in this Section.
   2. Division 06 Sections for shop priming carpentry with primers specified in this Section.
   3. Division 08 Sections for factory priming doors with primers specified in this Section.

1.3 DEFINITIONS

A. Gloss Level 1: Not more than 5 units at 60 degrees and 10 units at 85 degrees, according to ASTM D 523.

B. Gloss Level 3: 10 to 25 units at 60 degrees and 10 to 35 units at 85 degrees, according to ASTM D 523.

C. Gloss Level 4: 20 to 35 units at 60 degrees and not less than 35 units at 85 degrees, according to ASTM D 523.

D. Gloss Level 5: 35 to 70 units at 60 degrees, according to ASTM D 523.

E. Gloss Level 6: 70 to 85 units at 60 degrees, according to ASTM D 523.

F. Gloss Level 7: More than 85 units at 60 degrees, according to ASTM D 523.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product. Include preparation requirements and application instructions.

B. Samples for Initial Selection: For each type of topcoat product.

C. Samples for Verification: For each type of paint system and each color and gloss of topcoat.

1. Submit Samples on rigid backing, 8 inches (200 mm) square.
2. Step coats on Samples to show each coat required for system.
3. Label each coat of each Sample.
4. Label each Sample for location and application area.

D. Product List: For each product indicated, include the following:

1. Cross-reference to paint system and locations of application areas. Use same designations indicated on Drawings and in schedules.
2. Printout of current "MPI Approved Products List" for each product category specified, with the proposed product highlighted.
3. VOC content.

1.5 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Paint: 5 percent, but not less than 1 gal. (3.8 L) of each material and color applied.

1.6 QUALITY ASSURANCE

A. Mock-ups: Apply mock-ups of each paint system indicated and each color and finish selected to verify preliminary selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.

1. Architect will select one surface to represent surfaces and conditions for application of each paint system specified in Part 3.

a. Vertical and Horizontal Surfaces: Provide samples of at least 100 sq. ft. (9 sq. m).
b. Other Items: Architect will designate items or areas required.

2. Final approval of color selections will be based on mock-ups.

a. If preliminary color selections are not approved, apply additional mock-ups of additional colors selected by Architect at no added cost to Owner.

3. Approval of mock-ups does not constitute approval of deviations from the Contract Documents contained in mock-ups unless Architect specifically approves such deviations in writing.
4. Subject to compliance with requirements, approved mock-ups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 deg F (7 deg C).

1. Maintain containers in clean condition, free of foreign materials and residue.
2. Remove rags and waste from storage areas daily.

1.8 FIELD CONDITIONS

A. Apply paints only when temperature of surfaces to be painted and ambient air temperatures are between 50 and 95 deg F (10 and 35 deg C).

B. Do not apply paints in snow, rain, fog, or mist; when relative humidity exceeds 85 percent; at temperatures less than 5 deg F (3 deg C) above the dew point; or to damp or wet surfaces.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Benjamin Moore & Co.
2. ICI Paints.
3. Kelly-Moore Paints.
4. PPG.
5. Sherwin-Williams Company (The).

B. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to products listed in other Part 2 articles for the paint category indicated.

2.2 PAINT, GENERAL

A. MPI Standards: Provide products that comply with MPI standards indicated and that are listed in its "MPI Approved Products List."

B. Material Compatibility:

1. Provide materials for use within each paint system that are compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
2. For each coat in a paint system, provide products recommended in writing by manufacturers of topcoat for use in paint system and on substrate indicated.

C. VOC Content: Provide materials that comply with VOC limits of authorities having jurisdiction. Provide low-emitting paints and coatings with manufacturer's certification that materials comply with the requirements of Green Seal standard GS-11, Green Seal Standard GC-03 and SCAQMD #1113 as applicable. Use only MPI listed materials having an "L" rating designation.

1. Colors: As selected by Architect from manufacturer's full range.

2.3 PRIMERS/SEALERS

A. Primer, Alkali Resistant, Water Based: MPI #3.

B. Primer, Bonding, Water Based: MPI #17.

C. Wood-Knot Sealer: Sealer recommended in writing by topcoat manufacturer for exterior use in paint system indicated.

2.4 BLOCK FILLERS

A. Block Filler, Latex, Exterior: MPI #4.

2.5 METAL PRIMERS

A. Primer, Alkyd, Anti-Corrosive for Metal: MPI #79.

B. Primer, Alkyd, Quick Dry, for Metal: MPI #76.

C. Primer, Galvanized, Water Based: MPI #134.

D. Primer, Galvanized: As recommended in writing by topcoat manufacturer.

E. Primer, Quick Dry, for Aluminum: MPI #95.

2.6 WOOD PRIMERS

A. Primer, Latex for Exterior Wood: MPI #6.

2.7 WATER-BASED PAINTS

A. Latex, Exterior Flat (Gloss Level 1): MPI #10.

B. Latex, Exterior Semi-Gloss (Gloss Level 5): MPI #11.

C. Latex, Exterior, Gloss (Gloss Level 6: MPI #119.

D. Light Industrial Coating, Exterior, Water Based (Gloss Level 3): MPI #161.

E. Light Industrial Coating, Exterior, Water Based, Semi-Gloss (Gloss Level 5): MPI #163.

F. Light Industrial Coating, Exterior, Water Based, Gloss (Gloss Level 6): MPI #164.

2.8 SOURCE QUALITY CONTROL

A. Testing of Paint Materials: Owner reserves the right to invoke the following procedure:

1. Owner will engage the services of a qualified testing agency to sample paint materials. Contractor will be notified in advance and may be present when samples are taken. If paint materials have already been delivered to Project site, samples may be taken at Project site. Samples will be identified, sealed, and certified by testing agency.
2. Testing agency will perform tests for compliance with product requirements.
3. Owner may direct Contractor to stop applying paints if test results show materials being used do not comply with product requirements. Contractor shall remove non-complying paint materials from Project site, pay for testing, and repaint surfaces painted with rejected materials. Contractor will be required to remove rejected materials from previously painted surfaces if, on repainting with complying materials, the two paints are incompatible.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.

B. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:

1. Concrete: 12 percent.
2. Masonry (Clay and CMU): 12 percent.
3. Wood: 15 percent.
4. Portland Cement Plaster: 12 percent.
5. Gypsum Board: 12 percent.

C. Portland Cement Plaster Substrates: Verify that plaster is fully cured.

D. Exterior Gypsum Board Substrates: Verify that finishing compound is sanded smooth.

E. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers.

F. Proceed with coating application only after unsatisfactory conditions have been corrected.

1. Application of coating indicates acceptance of surfaces and conditions.

3.2 PREPARATION

A. Comply with manufacturer's written instructions and recommendations in "MPI Manual" applicable to substrates and paint systems indicated.

B. Remove hardware, covers, plates, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.

1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection.

C. Clean substrates of substances that could impair bond of paints, including dust, dirt, oil, grease, and incompatible paints and encapsulants.

1. Remove incompatible primers and re-prime substrate with compatible primers or apply tie coat as required to produce paint systems indicated.

D. Concrete Substrates: Remove release agents, curing compounds, efflorescence, and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces to be painted exceeds that permitted in manufacturer's written instructions.

E. Masonry Substrates: Remove efflorescence and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces or mortar joints exceeds that permitted in manufacturer's written instructions.

F. Steel Substrates: Remove rust, loose mill scale, and shop primer if any. Clean using methods recommended in writing by paint manufacturer, but not less than the following:

1. SSPC-SP 2, "Hand Tool Cleaning."
2. SSPC-SP 3, "Power Tool Cleaning."
3. SSPC-SP 7/NACE No. 4, "Brush-off Blast Cleaning."
4. SSPC-SP 11, "Power Tool Cleaning to Bare Metal."

G. Shop-Primed Steel Substrates: Clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with the same material as used for shop priming to comply with SSPC-PA 1 for touching up shop-primed surfaces.

H. Galvanized-Metal Substrates: Remove grease and oil residue from galvanized sheet metal by mechanical methods to produce clean, lightly etched surfaces that promote adhesion of subsequently applied paints.

I. Aluminum Substrates: Remove loose surface oxidation.

J. Wood Substrates:

1. Scrape and clean knots. Before applying primer, apply coat of knot sealer recommended in writing by topcoat manufacturer for exterior use in paint system indicated.
2. Sand surfaces that will be exposed to view, and dust off.
3. Prime edges, ends, faces, undersides, and backsides of wood.

4. After priming, fill holes and imperfections in the finish surfaces with putty or plastic wood filler. Sand smooth when dried.

K. Plastic Trim Fabrication Substrates: Remove dust, dirt, and other foreign material that might impair bond of paints to substrates.

3.3 APPLICATION

A. Apply paints according to manufacturer's written instructions and recommendations in "MPI Manual."

1. Use applicators and techniques suited for paint and substrate indicated.
2. Paint surfaces behind movable items same as similar exposed surfaces. Before final installation, paint surfaces behind permanently fixed items with prime coat only.
3. Paint both sides and edges of exterior doors and entire exposed surface of exterior door frames.
4. Paint entire exposed surface of window frames and sashes.
5. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.
6. Primers specified in painting schedules may be omitted on items that are factory primed or factory finished if acceptable to topcoat manufacturers.

B. Tint undercoats same color as topcoat, but tint each undercoat a lighter shade to facilitate identification of each coat if multiple coats of same material are to be applied. Provide sufficient difference in shade of undercoats to distinguish each separate coat.

C. If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform paint finish, color, and appearance.

D. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.

E. Painting Fire Suppression, Plumbing, HVAC, Electrical, Communication, and Electronic Safety and Security Work:

1. Paint the following work where exposed to view:

a. Equipment, including panelboards and switch gear.
b. Uninsulated metal piping.
c. Uninsulated plastic piping.
d. Pipe hangers and supports.
e. Metal conduit.
f. Plastic conduit.
g. Tanks that do not have factory-applied final finishes.

3.4 FIELD QUALITY CONTROL

A. Dry Film Thickness Testing: Owner may engage the services of a qualified testing and inspecting agency to inspect and test paint for dry film thickness.

1. Contractor shall touch up and restore painted surfaces damaged by testing.
2. If test results show that dry film thickness of applied paint does not comply with paint manufacturer's written recommendations, Contractor shall pay for testing and apply additional coats as needed to provide dry film thickness that complies with paint manufacturer's written recommendations.

3.5 CLEANING AND PROTECTION

A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.

B. After completing paint application, clean spattered surfaces. Remove spattered paints by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.

C. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.

D. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

3.6 EXTERIOR PAINTING SCHEDULE

A. Steel Substrates:

1. Water-Based Light Industrial Coating System:

a. Prime Coat: Primer, alkyd, anti-corrosive for metal, MPI #79.
b. Prime Coat: Shop primer specified in Division 05 Section where substrate is specified.
c. Intermediate Coat: Light industrial coating, exterior, water based, matching topcoat.
d. Topcoat: Light industrial coating, exterior, water based, semi-gloss, MPI #163.

B. CMU Substrates:

1. Latex System:

a. Prime Coat: Block filler, latex, exterior, MPI #4.
b. Intermediate Coat: Latex, exterior, matching topcoat.
c. Topcoat: Latex, exterior, low sheen (Gloss Level 3), MPI #15.

C. Cement Board Soffits, Ceiling and Trim Substrates:

1. Latex System:

a. Prime Coat: Factory primer on cement board materials.
b. Intermediate Coat: Latex, exterior, matching topcoat.
c. Topcoat: Latex, exterior, low sheen (Gloss Level 3), MPI #15.

D. Galvanized-Metal Substrates:

1. Latex System:

a. Prime Coat: Primer, galvanized, water based, MPI #134.
b. Intermediate Coat: Latex, exterior, matching topcoat.
c. Topcoat: Latex, exterior semi-gloss (Gloss Level 5), MPI #11.

END OF SECTION 099113

SECTION 10 21 13 -TOILET COMPARTMENTS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS:

A. Drawings and General Provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.02 SUMMARY

A. This section includes manufactured toilet compartments
B. Types of toilet compartments include:
   1. Solid Phenolic Core
C. Construction styles of toilet compartments include:
   1. Overhead Braced
D. Construction styles of entrance and urinal screens include:
   1. Floor Supported

1.03 SUBMITTALS

A. General: Submit the following in accordance with Conditions of Contract and Division 1 Specification sections.
B. Product data for materials, fabrication, and installation including catalog cuts of anchors, hardware, fastenings, and accessories.
C. Shop drawings for fabrication and installation of compartment assemblies that are not fully described by architectural drawings. Provide template layouts and installation instructions for anchorage devices built into other work.
D. Samples of full color range for each required unit type. Submit Tex-Lam's standard color selections; Wilson Art or Formica brand will be used, project scope not limited to 'Standard'.

1.04 QUALITY ASSURANCE

A. Field Measurements: Take field measurements prior to component fabrication to ensure proper fitting of work.
B. Coordination: Furnish inserts and anchorages that must be built into other work for installation of toilet compartments and related items.

PART 2 - PRODUCTS

2.01 MANUFACTURERS:
Subject to compliance with requirements, provide products by:
A. Tex-Lam Manufacturing, Inc., Houston, Texas 77091 (713) 695-5975. Or Equal.

2.02 MATERIALS

A. General: Provide material that has been selected for surface flatness and smoothness. Exposed surfaces that exhibit seam marks, roller marks, discoloration, telegraphing of core, or other imperfections on finished units are not acceptable.
B. Solid Phenolic Core:

1. Solid Phenolic Core:
   Tex-Lam's Solid Phenolic Core High Pressure Decorative Laminate with textured finished surfaces shall have a minimum Class B fire rating. All edges shall be polished black. Pilasters have a ¾-inch thickness, panels ½-inch, and doors ¾-inch.

C. Pilaster Shoes: Shall be 18 gage Type 304 stainless steel, not less than 5-inch high, Number 4 Satin (brushed) finish.

D. Brackets: Tex-Lam standard design for attaching panels to walls, pilasters to walls, and panels to pilasters shall be Type 304 stainless steel with Number 4 Satin finish hardware.

E. Overhead Bracing: Continuous extruded aluminum, anti-grip profile, with clear commercial anodized finish. Headrail returns as shown on shop drawings.

F. Anchorages and Fasteners: All concealed steel fasteners shall have a zinc-plated, rust-resistant, coating. Exposed fasteners for Solid Phenolic Core shall be stainless steel.

2.03 FABRICATION

A. General: Furnish standard doors, panels, screens and pilasters fabricated for compartment system. Furnish units with cutouts as required to receive accessories as indicated.

B. Door Dimensions: Unless otherwise indicated, furnish 24-inch wide in-swing doors for ordinary toilet compartments and minimum 34-inch wide out-swing doors for compartments that meet the requirements of the Americans with Disabilities Act (ADA).

C. Restroom Compartments, Entrances and Urinal Screens:
   1. Solic Phenolic Core: Solic Phenolic Core Panels are composed of melamine-impregnated decorative surface papers superimposed over a varying number of phenolic saturated kraft paper core sheets to achieve a desired thickness. Phenolic Core Fire Resistance Characteristics per ASTME84. Standard product has Class "B" rating. Flame Spread Index of 35/Smoke 100.

D. Construction Types of Toilet Compartments, Entrance Screens and Urinal Screens:
   1. Overhead Braced (XLFH): Furnish aluminum supports and leveling bolts at pilasters to suit floor conditions. Make provisions for setting and securing overhead bracing at the top of each pilaster. Provide 5-inch height shoe at each pilaster to conceal supports and leveling mechanism.
   2. Provide continuous angle support at all wall mounted urinal screens.

E. Hardware: Furnish hardware to comply with ANSI A117.1 and Title III of the Americans with Disabilities Act (ADA) as follows:
   1. Hinges: Supply minimum stainless steel piano hinge Type 304 with Number 4 finish. Emergency access is available for outside access. Tex-Lam #420 stainless steel surface mounted with cam hinges to be used as alternate to piano hinge.
   2. Latch and Keeper: Type 304 stainless steel with Number 4 finish. Latching device shall consist of a slide latch with combination stop and emergency release feature.
   3. Coat Hook: Type 304 stainless steel with Number 4 finish coat hook and/or combination coat hook and door bumper.
   4. Door Pull: Type 304 cast stainless steel with a Number 4 finish.

PART 3 - EXECUTION

3.01 INSTALLATION

A. General: Comply with manufacturer's recommended procedures and installation sequence. Install compartment units rigid, straight, plumb and level. Provide clearance of not more than ½-inch between pilasters and panels and not more than 1-inch between panels and walls. Secure panels to walls with not less than two brackets attached near top and bottom of panel. Locate wall brackets so that holes for wall anchorages occur in masonry or tile joints. Secure panels to pilasters with not less than two brackets located to align with brackets at wall. Secure panels in position with manufacturer's recommended anchoring devices.
B. Overhead Braced Compartments (XLFH): Secure pilaster to floor and level, plumb and tighten installation with devices furnished. Secure overhead brace to each pilaster with fasteners supplied. Hang doors and adjust so that tops of doors are parallel with overhead brace when doors are in a closed position.
C. Screens (FX): Attach with anchoring devices as recommended by manufacturer to suit supporting structure with full-length Type 304 Stainless Steel wall brackets. Set unit to provide support and to resist lateral impact with a 5-inch width floor mounted pilaster ¾-inch in thickness.

3.02 ADJUSTING AND CLEANING

A. Hardware Adjustment: Adjust and lubricate hardware for proper operation. Set hinges on in-swing doors to hold open approximately 30 degrees from closed position when unlatched. Set hinges on out-swing doors to return to a fully closed position
B. Clean and Protect: Clean exposed surfaces of compartment systems using materials and methods recommended by manufacturer, and provide protection as necessary to prevent damage during remainder of construction period.

END OF SECTION

SECTION 10 42 50 - SIGNS

PART 1- GENERAL

1.01 GENERAL COMMENTS

A. The general and special conditions of these specifications shall both be considered as a part of this section insofar as they may be termed applicable whether attached or not.
B. Cooperation by the Contractor for work of this section of the specifications with all other trades is mandatory, so that all phases of the work may be properly coordinated without delays or damage to any parts of the work.
C. The Contractor shall provide all items, materials, operations listed or scheduled on the drawings and/or herein, including all labor, materials, equipment and incidentals necessary for their completion.

1.02 SUMMARY

A. Provide building signage: Panel signs to the T.A.S. standards for accessibility.
B. Allowance: $2,000

1.03 SUBMITTALS

A. Submit for approval samples, shop drawings, product data.

1.04 QUALITY ASSURANCE

A. Comply with governing codes and regulations. Provide products of acceptable manufacturers which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.
B. Regulations: ADAAG.

PART 2- PRODUCTS

2.01 MATERIALS

A. Manufacturers: St. George Sign Co., South Texas Graphic Specialties or approved equal.
B. Panel Signs: Signs to be 6" x 6" pictograms or 2” tall as per schedule. 6” x 6” signs to have 30 degree x ½” long chamfer on corners. Pictogram signs to have one logo per sign and 1” tall removable name plate.
   1. Type: Unframed.
   2. Material: Plastic or plastic laminate
   3. Copy: Raised lettering. Per ADA.
   4. Braille as per ADA on all signs.

PART 3- EXECUTION

3.01 INSTALLATION

A. Install materials and systems in accordance with manufacturer's instructions and approved submittals. Install materials and systems in proper relation with adjacent construction and with uniform appearance. Coordinate with work of other sections.
B. Restore damaged finishes. Clean and protect work from damage.

END OF SECTION 10 42 50