TEXAS PARKS AND WILDLIFE

Contracting Branch
Infrastructure Division
4200 Smith School Road
Austin, Texas 78744

INVITATION FOR BIDS

AND

CONTRACT DOCUMENTS

FOR

PROJECT NUMBER 128696
CF DICKINSON MARINE LABORATORY
DICKINSON, GALVESTON COUNTY, TEXAS

FLOOD REPAIRS

P-O-C:

Cruz Banda, Contract Manager, 512/389-8761

ISSUE DATE*:* May 15 ,2018
BIDS DUE NO LATER THAN
2:00 PM, JUNE 7, 2018

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NOTICE TO BIDDERS

Sealed bids will be received by the Contracting Branch, Infrastructure Division, Texas Parks and Wildlife Department, 4200 Smith School Road, Austin, Texas 78744, **UNTIL 2:00 P.M., JUNE 7, 2018** for Project Number 128696 – Flood Repairs, CF Dickinson Marine Laboratory, Galveston County, Texas. The bid opening will be conducted in A-100 Conference Room. The estimated range of construction cost is $480,000.00 to $550,000.00.

Project includes:

Base Bid Item: Flood Repairs for Building "A". Furnish all labor, tools, equipment, materials and incidentals for completion for the Base Bid work for the comprehensive renovation and repair of the flood damaged Building "A" to the full extent in accordance with the Drawings, Specifications and Bidding and Contract Documents.

Bid Option Item: Flood Repairs for Building "B". Furnish all labor, tools, equipment, materials and incidentals for the Bid Option One (1) to complete the comprehensive renovation and repair of the flood damaged Building "B" to the full extent in accordance with the Drawings, Specifications and Bidding and Contract Documents.

Performance Period: All work shall be completed **on or before NOVEMBER 30, 2018 for Building "A"** commencing on the date specified in the Notice to Proceed. All work shall be completed **on or before JANUARY 15, 2019 for Building "B"** commencing on the date specified in the Notice to Proceed.

Minimum Experience Requirements: Bidder must meet minimum qualifications requirements as stipulated in Division 1 – General Requirements, Section 01000 – Special Conditions, paragraph 1.33 to be eligible for contract award.

HUB Subcontracting Plan (HSP): Each bidder must complete and return with the bid a HSP following the policy and utilizing the forms contained with the Bidding and Contract Documents included herein. FAILURE TO COMPLETE AND RETURN THESE FORMS WITH THE BID WILL BE CAUSE FOR REJECTION OF THE BID. THE CONTRACTOR RECEIVING AN AWARD MUST COMPLY WITH THE SPECIAL REQUIREMENTS SPECIFIED HEREIN.

For questions, call HUB Staff, 512/389-4784. An instructional video, Microsoft Word® documents and PowerPoint® presentation can be located at: http://tpwd.texas.gov/business/bidops/hub/HSP/index.phtml .

Pre-Bid Conference: A pre-bid conference will NOT be conducted for this Project. A visit to the project site is not mandatory, however, TPWD strongly encourages potential bidders to view the project site, and offers no guarantee that the project site will be accessible to potential bidders at any time other than the time specified in this solicitation package. Therefore, failure to take advantage of the site visit time listed herein may result in potential bidders who are unable to visit the project site at all. Failure to give proper consideration to site conditions when preparing the bid will not constitute grounds for additional compensation. Site Visits can be scheduled by contacting Roger Padon, Construction Manager at 512/627-4417. Scheduled Site Visits Dates and Times are listed below. CF Dickinson Marine Laboratory is located at 1502 FM 517 East, Dickinson, Texas 77539

Site Visit #1 – Tuesday, May 22, 2018 at 1:30 PM to 2:30 PM

Site Visit #2 – Friday, May 25, 2018 at 9:00 AM to 10:00 AM

PROTEST PROCEDURES: Any Actual or prospective Respondent who is aggrieved in connection with this solicitation, evaluation, or award of any contract resulting from this solicitation may formally protest as provided in TPWD's rules at TAC, Title 31, Part 2, Chapter 51, Subchapter L, Rule 51.350, located at: http://texreg.sos.state.tx.us/public/readtac$ext.TacPage?sl=R&app=9&p_dir=&p_rloc=&p_tloc=&p_ploc=&pg=1&p_tac=&ti=31&pt=2&ch=51&rl=350

Contact Information: For technical information and information regarding administration of the contract, contact Contract Manager, Cruz Banda at 512-389-8761.

To view and download full Bidding and Contract Documents, visit the TWPD web site using:
http://tpwd.texas.gov/business/bidops/current_bid_opportunities/construction/

For upcoming projects, visit the Electronic State Business Daily web site: http://esbd.cpa.state.tx.us/
and the TPWD web site: http://www.tpwd.state.tx.us/business/bidops/current_bid_opportunities.

TEXAS PARKS AND WILDLIFE

INSTRUCTIONS TO BIDDERS

1. **BIDS:** Bids must be received in the Infrastructure Division of the Texas Parks and Wildlife Department (TPWD), Austin, Texas NO LATER THAN the date and time specified in the Notice to Bidders. Bids received after this time will not be considered and will be returned unreviewed. **Bidders are advised that TPWD's Headquarters Complex does not open until 8:00 A.M. Bidders should plan their delivery method accordingly.** Each bid shall be submitted on the Contractor's Bid form provided**.**

FAXED BIDS WILL NOT BE ACCEPTED. BIDS MUST BE ENCLOSED IN A SEALED ENVELOPE, BOX, OR CONTAINER CLEARLY MARKED ON THE OUTSIDE AS AN "OFFICIAL BID" AND SHALL INCLUDE THE FOLLOWING INFORMATION: PROJECT NUMBER, PROJECT DESCRIPTION, PROJECT LOCATION, BID OPENING DATE AND TIME.

Bids shall have all blanks fully and legibly completed including a price for all alternates and/or unit costs when listed under the base bids on which a bid is submitted. Failure to do so shall result in rejection of the bid. Corrections in the bidder's bid shall be legible and initialed. The bid form shall show no alterations or qualifications of any kind**. Bids must be signed by an individual who has the authority to legally bind the firm.** The Owner reserves the right to require a bidder to furnish documentary evidence of Bidder's signature authority.

Corrections, deletions, or additions to bids may be made by facsimile (FAX), provided such FAX are received in correct and comprehensive form prior to the opening time of bids and an original reflecting said corrections, deletion, or additions must be submitted to the Owner within two (2) business days of submitted FAX. No telephonic instructions will be accepted. **FAX corrections, deletions or additions to bids shall be sent to FAX number: 512/389-4790, attention: Cruz Banda.** This is the only number that will be used for receipt of corrections, deletions, or additions. TPWD shall NOT be responsible for failure of electronic equipment or operator error.

The Owner reserves the right to reject any or all bids and to waive any or all informalities in connection therewith. Owner does not bind itself to accept the lowest bid or any part thereof, and reserves the right to ask for new bids for the whole or parts. The mere opening and reading aloud of a bid shall not constitute the Owner's acceptance of the suitability of a bidder or a bid. The competency and responsibility of the bidders will be considered in making an award.

2. **BASIS OF AWARD:** Determination of the low bidder will be based on the lowest responsible base bid and/or a combination of the base bid and alternate bids. Alternates accepted will be considered in determining the low bidder, but the Owner does not obligate itself to accept an alternate or to accept alternates in any order listed unless otherwise stipulated elsewhere in the Bidding and Contract Documents.

3. **UNIT PRICE/ESTIMATED QUANTITY BIDS:** If the Bid furnished with this project requires a bid on a unit price/estimated quantity basis, the Bidder shall enter a unit price in the space provided therefor and a total item price based upon the estimated quantities shown on the bid form. Unit prices entered shall be the full price to Owner including materials, labor, services, taxes, bonds, rentals, overhead, profit, etc., for the work described. Quantities shown reflect measurements taken from the Drawings and are assumed correct for bidding purposes. Final contract price will be based on actual quantities of work installed as determined by Owner and Contractor upon completion of the work.

Award of contract shall be based upon the summation of the various unit price bids, but in case of error the unit prices shall govern and computations will be checked for accuracy before award is made.

Prices will also be reviewed for balance prior to award, and obvious imbalance in favor of work scheduled for

early completion or subject to significant expansion after award may be grounds for rejection of the bid.

4. **BID SECURITY:** Unless otherwise stipulated in the Bidding and Contract Documents, only projects in which the total contract price exceeds $25,000.00, will require bid security. **Bids exceeding $25,000.00 must be accompanied by a bid bond, certified check or cashier's check drawn to the order of the Texas Parks and Wildlife Department for not less than five percent (5%) of the total amount of the bid (including total of all separate bids for one or more projects bid and multiple base bids and/or alternate bids and/or optional bids and/or allowances).** Therefore, to ensure adequate bid security, bidders should calculate bid security based on the highest possible monetary award. Certified checks and cashier checks must be originals. No other forms of bid security or checks will be accepted. **Bid will be rejected if the appropriate security is not furnished in the form specified above and by the time set for the bid opening.**

Bid security for three (3) lowest bidders may be retained by Owner until the successful bidder executes the contract, and if required, furnishes bonds and certificates of insurance. All other bid security will be returned as soon as practical after bid opening.

Bid security for the successful bidder will be returned following execution of the contract and submission of satisfactory bonds and insurance. If the successful bidder fails to return the signed contract (and bonds and certificate of insurance when required) within the time specified, the bid security may be forfeited not as a penalty but as liquidated damages.

5. **INSURANCE REQUIREMENTS:** The successful Contractor must certify the minimum insurance coverages as set forth in Exhibit A of the solicitation package entitled "Insurance Requirements". The required insurance information shall be submitted as directed within **ten (10) calendar days** following Notice of Intent to Award. Failure to timely meet this requirement may result in disqualification of the bid and forfeiture of the bid security, if any. In such circumstances, TPWD shall be authorized to proceed with award to the next highest ranking, responsive and responsible bidder.

6. **BONDING REQUIREMENTS:** If the total contract price exceeds $25,000.00, a Payment Bond must be furnished by the successful Contractor. If the total contract price exceeds $100,000.00 a Payment Bond and a Performance Bond must be furnished by the successful Contractor. All bonds submitted shall be the original form bearing original signatures and seal. (See also Article 5, Uniform General Conditions)

7. **DISCREPANCIES:** Should any Bidder find discrepancies between the Bidding and Contract Documents, or should Bidder be in doubt as to their exact meaning, Bidder should notify the Owner at once. The Owner may then, at its option, issue addenda clarifying same. The Owner will not be responsible for oral instructions or for misinterpretation of Bidding and Contract Documents.

8. **ADDENDA:** The Owner reserves the right to issue addenda at any time prior to the bid opening. (See also General Requirements – Special Conditions). All addenda shall be acknowledged as received on the Contractor's Bid Form. Oral changes in the work made during the bidding period are not binding. **BIDDER'S FAILURE TO ACKNOWLEDGE RECEIPT OF ADDENDA MAY RESULT IN REJECTION OF BID.**

No oral explanation in regard to the meaning of the Bidding Documents will be made and no oral instructions will be given before the award of the contract. The Owner requests that all discrepancies, omissions or questions as to the meaning of Drawings and Specifications shall be communicated in writing to the Contract Manager for interpretation by **May 30, 2018** to the attention of **Cruz Banda, Contract Manager** at the address stated in these Bidding and Contract Documents or via email to cruz.banda@tpwd.texas.gov or via fax at 512-389-4790.

9. **PROHIBITED COMMUNICATIONS:** Upon issuance of this solicitation, TPWD, its representative(s), or partners will not answer questions or otherwise discuss the contents of this Solicitation with any potential Bidder or their representatives(s), except for the written inquiries described in the foregoing paragraph. Attempts to ask questions by phone or in person will not be allowed or recognized as valid.

Failure to observe this restriction may disqualify Bidder. Bidder shall rely only on written statements issued through or by TPWD's contracting staff. This restriction does not preclude discussions between affected parties for the purposes of conducting business unrelated to this solicitation.

10. **LABOR LAWS:** Contractors must comply with all labor laws established by State and Federal statutes. (See also Article 2, Uniform General Conditions).

11. **STATE SALES TAX:** The Owner qualifies for exemption from State and Local Sales and Use Taxes pursuant to the provisions of the Texas Tax Code (Title 2, Chapter 151, Subsection 151.309).

The Contractor shall comply with applicable provisions of Chapter 34, Rules 3.291 and 3.357 of the Texas Administrative Code, or other procedures as may be prescribed by the State Comptroller of Public Accounts. Refer to Uniform General Conditions, Article. 2.

12. **LIQUIDATED DAMAGES:** This contract contains provisions for liquidated damages. (See Uniform General Conditions and Division 1, General Requirements – Special Conditions)

13. **CONTRACTOR QUALIFICATIONS:** A Contractor's Statement of Qualifications must be submitted with the bid. Failure to properly complete and provide a Contractor's Statement of Qualifications shall be cause for the Contractor's bid being rejected by the Owner. The Owner may make such investigations as necessary to determine the ability of the Contractor to perform the work, and reserves the right to reject any bid if the evidence submitted and/or obtained through investigation fails to satisfy the Owner that the Contractor is properly qualified to carry out the obligations of the Agreement.

14. **TEXAS IDENTIFICATION NUMBER:** Prior to any payment by Owner for the work or services required herein, the Contractor must be assigned a TEXAS IDENTIFICATION NUMBER (TIN) by the State Comptroller of Public Accounts. A space has been provided on the Contractor's Bid Form for provision of a TEXAS IDENTIFICATION NUMBER if available. If Contractor has not been assigned a TIN, the application form provided in the Bidding and Contracting Documents shall be submitted with the Bid.

15. **SPECIAL REQUIREMENTS:** Bidders should refer to all of the Bidding and Contract Documents for special project requirements, if any, that may affect bidding.

16. **HISTORICALLY UNDERUTILIZED BUSINESS REPRESENTATIONS & CERTIFICATIONS**: **BIDDERS ARE ADVISED THAT**, in accordance with Texas Government Code, Sections 2161.181-182 and Chapter 111 of the Texas Administrative Code (TAC), state agencies must make good faith effort to utilize Historically Underutilized Businesses (HUBs) in contracts for construction services, professional and consulting services and commodities contracts with an expected value of $100,000.00 or more. **Each bidder must complete and return with the bid a HUB Subcontracting Plan (HSP) following the policy and utilizing the forms contained with the Bidding And Contract Documents included herein. FAILURE TO COMPLETE AND RETURN THESE FORMS WITH THE BID WILL BE CAUSE FOR REJECTION OF THE BID. THE CONTRACTOR RECEIVING AN AWARD MUST COMPLY WITH THE SPECIAL REQUIREMENTS SPECIFIED HEREIN. For questions, call HUB Staff, 512/389-4784. An instructional video, Microsoft Word® documents and PowerPoint® presentation can be located d at: http://tpwd.texas.gov/business/bidops/hub/HSP/index.phtml .**

18. **FOR INCLUSION OF ADDITIONAL WORK**: The Owner may require the performance of additional work described in the Contractor's Bid as an Option Item at the price(s) specified by giving written notice to the Contractor within the time specified. Performance of said additional work will be directed by Change Order.

CONTRACTOR'S BID SUBMITTALS

TEXAS PARKS AND WILDLIFE

CONTRACTOR'S BID

Texas Parks and Wildlife Department
4200 Smith School Road
Austin, Texas 78744

Having carefully examined the Bidding and Contract Documents for **Project No. 128696- Flood Repairs at CF Dickinson Marine Laboratory, Galveston County, Texas** for the Texas Parks and Wildlife Department, as well as the premises and conditions affecting this work, and all other contract documents, the undersigned proposes to furnish all labor, equipment and materials necessary to complete the work for the sum of:

BID SCHEDULE

NO.	BASE BID ITEM	LUMP SUM PRICE
1.	**Flood Repairs for Building "A"**. Furnish all labor, tools, equipment, materials and incidentals for completion for the Base Bid work for the comprehensive renovation and repair of the flood damaged **Building "A"** as indicated on the construction documents in accordance with the Bidding and Contract Documents. Work to be substantially complete on or before **NOVEMBER 30, 2018** for Building "A".	$
_____ **(Total Lump Sum Base Bid Item written in words)**		

NO.	BID OPTION ITEM	LUMP SUM PRICE
2.	**Flood Repairs for Building "B"**. Furnish all labor, tools, equipment, materials and incidentals for the Bid Option One (1) to complete the comprehensive renovation and repair of the flood damaged **Building "B"** as indicated on the construction documents in accordance with the Bidding and Contract Documents. Work to be substantially complete on or before **JANUARY 15, 2019** for Building "B". **Bid Option One (1)** includes the complete environmental Remediation work for Building "B" before flood repairs can commence. **Bid Option One (1)** work is in addition to the Base Bid Item work. If accepted, the Bid Option One (1) work may proceed concurrent with Base Bid Item work for Building "A".	$
_____ **(Total Lump Sum Bid Option written in words)**		

TOTAL PRICE: TOTAL LUMP SUM OF BASE BID ITEM PLUS BID OPTION ITEM:	**$**

_____

TOTAL PRICE (Total Lump Sum Base Bid Item Plus Bid Option Item written in words)

EACH BASE BID AND BID OPTION ITEM INCLUDES ANY AND ALL APPURTENANT WORK AND ITEMS NECESSARY FOR FULLY FUNCTIONAL AND OPERATIONAL SYSTEMS, COMPLETE AND IN PLACE, IN ACCORDANCE WITH THE BIDDING AND CONTRACT DOCUMENTS.

BASE BID plus BID OPTION will be evaluated and determination of the low bidder will be based on responsiveness and responsibility of the bidder and on the lowest total price. HOWEVER, THE OWNER RESERVES THE RIGHT TO AWARD TO THE LOW BIDDER ANY COMBINATION OF THE TOTAL BASE BID AND BID OPTION ITEMS OR TO REJECT ALL BIDS.

UNIT PRICE as stated in the BID SCHEDULE is the price per unit of measure for materials and services to be added to the Contract Sum by appropriate change order in the event it is determined by Owner that the materials and services are necessary.

UNIT PRICE ITEM NO. 1: Exterior Stud Track Runner Framing Replacement	**UNIT OF MEASURE**	**UNIT PRICE**
For replacement of any exterior wall galvanized steel stud floor track runners beyond the **75% Base Bid** assumption, furnish all labor, equipment, materials, and incidentals for additional replacement of track runners in accordance with the Bid and Contract Documents.	Per LF Length in Linear Feet	$

UNIT PRICE ITEM NO. 2: Duplex Electrical Receptacle Replacement	**UNIT OF MEASURE**	**UNIT PRICE**
For replacement of any found defective and non-repairable electrical wall outlets, furnish all labor, equipment, materials, and incidentals for full replacement per unit in accordance with the Bid and Contract Documents. Base Bid assume all receptacles are salvageable, will be cleaned and tested to determine suitability to remain in service.	Per Unit	$

UNIT PRICE ITEM NO. 3: Data Outlet Receptacle Replacement	UNIT OF MEASURE	UNIT PRICE
For replacement of any found defective and non-repairable Data wall outlets, furnish all labor, equipment, materials, and incidentals for full replacement per unit in accordance with the Bid and Contract Documents. Base Bid assume all receptacles are salvageable, will be cleaned and tested to determine suitability to remain in service.	Per Unit	$

UNIT PRICE ITEM NO. 4: Re-lamp Salvaged 2x4 Lay-in Ceiling Light Fixtures	UNIT OF MEASURE	UNIT PRICE
All 2x4 lay-in light fixtures are to be salvaged and re-used. Most of the fixtures have been upgraded to LED lamps. For all fixtures determined in the field not have been upgraded shall be retrofitted with Owner supplied LED lamps and DC power converters on a Unit Price Basic. Furnish all labor, equipment, testing and incidentals to complete lamp replacements in accordance with the Bid and Contract Documents. Refer to the Drawings for all locations.	Per Unit	$

BIDDER UNDERSTANDS AND ACKNOWLEDGES THAT BIDDER MUST MEET THE MINIMUM QUALIFICATION AND/OR EXPERIENCE REQUIREMENTS SET FORTH IN PARAGRAPH 1.33 OF THE SPECIAL TERMS AND CONDITIONS TO BE ELIGIBLE FOR AWARD OF THIS CONTRACT. BIDDER, BY SIGNING THIS BID, AFFIRMS THAT BIDDER MEETS SUCH MINIMUM REQUIREMENTS. FAILURE TO MEET ANY OF THE MINIMUM QUALIFICATIONS SHALL RESULT IN REJECTION OF THE BID.

The undersigned further agrees that, if awarded the Contract, the work will be completed within the Dates Listed above commencing on the date specified in the Notice to Proceed.

The undersigned agrees that when written notice of bid acceptance is furnished by the Owner within **sixty (60)** calendar days after the bid opening date, the undersigned will, within ten (10) days from receipt of such notice, execute and deliver the contract and all required bonds, certificates of insurance, and PR-1 and PR-2 submittals to the Owner. Failure to timely provide the insurance certificate, bonds, and submittals shall be grounds for disqualification of bid and forfeiture of bid security. In such circumstances, TPWD shall be authorized to proceed with award to the next lowest, responsive and responsible bidder.

If the above bid amount exceeds $25,000.00, the undersigned shall include herewith security in the form of a bid bond, certified check, or cashier's check for an amount not less than five percent (5%) of the total amount of the bid to be awarded by Owner, unless otherwise stipulated under Special Conditions. To ensure adequate bid security, bidders should calculate bid security based on the total amount of all base bids plus all additive alternate bids (if any). The bid security will be returned to or forfeited by the undersigned in accordance with the Bid Security provision in the Instructions to Bidders. The undersigned further agrees that this bid security is the appropriate measure of liquidated damages which the Owner will sustain by the failure of the undersigned to execute and deliver said contract and required documents.

The undersigned agrees that this proposal will not be withdrawn for a period of sixty (**60)** calendar days from the date set for the bid opening, and the undersigned further agrees that the bid security will be forfeited in the event this proposal is withdrawn before expiration of said sixty (**60)** calendar days.

By the signature hereon affixed, the bidder hereby certifies that neither the bidder, nor the firm, corporation, partnership, or institution represented by the bidder, or anyone acting for such firm, corporation, or institution has violated the antitrust laws of this State, codified in Section 15.01 et seq., *Texas Business and Commerce Code*, or the Federal antitrust laws, nor communicated directly or indirectly the bid made to any competitor or any other person engaged in such line of business.

Pursuant to *Texas Government Code*, Title 10, Subchapter A, §2155.004 (a), Bidder acknowledges that Bidder has not received compensation for participation in the preparation of the specifications for this project.

Pursuant to *Texas Government Code*, Title 10, Subchapter A, §2155.004 (b), §2155.006 (c), and Subchapter B, §2261.053 (c), Bidder certifies that the individual or business entity named in this bid is not ineligible to receive the specified contract and acknowledges that this contract may be terminated and payment withheld if this certification is inaccurate.

By signing this bid, Bidder certifies that if a Texas address is shown as the address of the Bidder, Bidder qualifies as a Texas Resident bidder as defined in *Texas Administrative Code*, Title 1, Part 5, Chapter 111, Subchapter A, §111.2 (10).

By signature hereon, the bidder hereby certifies he is not currently delinquent in the payment of any franchise taxes owed the State of Texas under Chapter 171, Tax Code. Making a false statement as to corporate tax status is a material breach of contract.

Bidder certifies that the bidding entity and its principals are eligible to participate in this transaction and have not been subjected to suspension, debarment, or similar ineligibility determined by any federal, state or local governmental entity and that bidder is in compliance with the State of Texas Statutes and Rules relating to procurement and that bidder is not listed on the Federal Government's Terrorism Watch List as described in Executive Order 13224. Entities ineligible for federal procurement are listed at http://www.sam.gov.

By signing this bid, a bidder affirms that he has not given, offered to give, nor intends to give at any time hereafter any economic opportunity, future employment, gift, loan, gratuity, special discount, trip, favor or service to a public servant in connection with the submitted bid.

Bidder agrees that any payments due under this contract will be applied towards any debt, including but not limited to delinquent taxes and child support, which is owed to the State of Texas.

Bidder agrees to comply with *Texas Government Code*, Title 10, Subtitle D, §2155.4441, relating to use of services contracts for products produced in the State of Texas.

Pursuant to *Texas Government Code*, Title 10, Subchapter F, §§ 2270.001-2270.002, TPWD may not enter into a contract with a company (as defined by *Texas Government Code*, Title 8, Subchapter A, § 808.001) that boycotts Israel. By signing this bid, Bidder verifies that in accordance with *Texas Government Code*, Title 10, Subchapter F, §§ 2270.001-2270.002, Bidder:

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

Pursuant to *Texas Government Code*, Title 10, Subchapter F, §§ 2252.151-2252.154, TPWD may not enter into a contract with a company (as defined by *Texas Government Code*, Title 8, Subchapter A, § 806.051) that is identified on a list prepared and maintained by the Texas Comptroller of Public Accounts under *Texas Government Code*, §§ 806.001, 807.051 or 2252.153. By signing this bid, Bidder certifies that it is not a company identified on a list as prepared and maintained by the Texas Comptroller of Public Accounts pursuant to *Texas Government Code*, §§ 806.001, 807.051 or 2252.153.

By signature hereon, the bidder acknowledges that *Texas Government Code*, Title 10, Subchapter F, §§ 2252.201-2252.205 requires that all iron or steel products produced through a manufacturing process used in this project must be produced in the United States. By signing this bid, Bidder certifies that its bid price represents full compensation for compliance with the requirements of *Texas Government Code*, Title 10, Subchapter F, §§ 2252.201-2252.205.

By signing this bid, Bidder acknowledges and understands that the acceptance of funds by the Bidder or any other entity or person directly under this Contract, or indirectly through a subcontract under this Contract, shall constitute acceptance of the authority of the State Auditor's Office, Comptroller or other agency of the State of Texas, TPWD or any successor agency, to conduct an audit or investigation in connection with those funds. The Bidder further agrees to cooperate fully with the above parties in the conduct of the audit or investigation, including providing access to any information the state auditor considers relevant to the investigation or audit. The Bidder shall ensure that this paragraph concerning the State's authority to audit funds received indirectly by subcontractors through the Bidder and the requirement to cooperate is included in any subcontract it awards.

If applicable, pursuant to Texas Family Code, Title 5, Subtitle D, §231.006(d), regarding child support, the Bidder certifies that the individual or business entity named in this bid is not ineligible to receive the specified payment and acknowledges that this contract may be terminated and payment may be withheld if this certification is inaccurate. Furthermore, Bidder must provide, in the spaces(s) below, the name and Social Security number of an individual owner, a sole proprietor and all partners, shareholders, or owners with an ownership interest of at least 25% of the business entity prior to award of contract.

Name	SSN	%
Name	SSN	%
Name	SSN	%
Name	SSN	%

Bidder certifies that they are in compliance with *Texas Government Code*, Title 6, §669.003, relating to contracting with executive head of a State agency. If §669.003 applies, Bidder will complete the following information in order for the bid to be evaluated:

Name of former executive: _____

Name of State agency: _____

Date of separation from State agency: _____

Position with Bidder: _____

Date of employment with Bidder: _____

Bidder acknowledges receipt of the following addenda: _____

WARNING: BIDDER'S FAILURE TO ACKNOWLEDGE RECEIPT OF ADDENDA MAY RESULT IN REJECTION OF BID.

BIDDER'S AFFIRMATION: SIGNING THIS BID WITH A FALSE STATEMENT IS A MATERIAL BREACH OF CONTRACT AND SHALL VOID THE SUBMITTED BID OR ANY RESULTING CONTRACTS, AND THE BIDDER SHALL BE REMOVED FROM ALL BID LISTS.

_____	By_____
Name of Contracting Firm	Authorized Signature Date
_____	_____
Address	Printed Name
_____	_____
City State Zip	Title
_____	_____
(Area Code) Phone Number	(Area Code) Phone Number
_____	_____
Email address	(Area Code) FAX Number
_____	_____
Texas Identification Number	(Area Code) Cell Number

TEXAS PARKS AND WILDLIFE

CONTRACTOR'S QUALIFICATION STATEMENT

COMPLETE AND SUBMIT WITH BID

PROJECT NO.	128696	**LOCATION:**	**CF Dickinson Marine Laboratory**	**BID DATE:**	**JUNE 7, 2018**

FIRM			
ADDRESS			
PHONE		FAX	
E-MAIL			
Individual _____	Partnership_____	Corporation _____	
If incorporated, under the laws of the State of _____ with principal place of business in _____			

PRINCIPALS IN FIRM AND YEARS EXPERIENCE IN CONSTRUCTION:

NAME	TITLE	PHONE	NO. OF YEARS

FIRM HISTORY: List firm history below including any other business names used.

From		to		Firm Name	
From		to		Firm Name	
From		to		Firm Name	
From		to		Firm Name	

Has firm, under its current or former name(s) ever failed to complete a project, defaulted on a contract, or been engaged in litigation over a contract? ____ Yes _____ No. If so, state particulars of most recent occurrence on separate sheet(s) and attach to this form.

CONSTRUCTION CAPABILITIES:

FIRM'S AVERAGE ANNUAL CONSTRUCTION VOLUME $ _____ Percentage of this volume by construction categories:

Building_____%	Mech.-HVAC_____%	Hwy/Roads_____%	Other_____%
Electrical_____%	Utility Lines_____%	Earthwork_____%	Other_____%
Plumbing_____%	Utility Plants_____%	Site Work_____%	Other_____%

FINANCIAL CAPABILITIES:

FINANCIAL INFORMATION SUMMARIZED BELOW WAS PREPARED BY:

ACCOUNTING FIRM		Address	
City/State/Zip		E-Mail	
Prepared by (name):		Phone	

FINANCIAL STATEMENT SUMMARY:

Current Assets		Current Liabilities	
Fixed Assets		Net Worth	
Total Assets		Total Liab. & Net Worth	

BONDING REFERENCES: Indicate agency/surety through which bonding will be obtained.

AGENCY		Address	
City/State.Zip		E-Mail	
Phone		Fax	
Agent's Name		Agent's Phone	
Name of Power of Attorney from Bond Company		Expiration Date	

BONDING COMPANY		Address	
City/State/Zip			
Phone		Fax	
Name of Representative		Phone	

BANKING REFERENCES:

BANK		Address	
City/State/Zip		E-Mail	
Bank Contact Name		Phone	Fax
Checking Acct. Numbers			
Loan Acct. Numbers			
CD/MM Acct. Numbers			

EXPERIENCE RECORD:

List a minimum of three (3) projects (attach additional sheets if necessary) that are at least 50% completed (*50% completed projects will be counted towards successful projects*) or have been completed within the last five (5) years and that demonstrate similar experience. Refer to DIVISION ONE – GENERAL REQUIREMENTS, Section 01000 - Special Conditions, paragraph 1.33.

1.

Project Description			
Project Location		Contract Amount	Beginning $ Ending: $
Project Owner (Firm/Agency)		Address	
City		State	Zip
Project Owner's Rep familiar with project		Phone	Fax
Contract Start Date (Date of Notice to Proceed)		Contract Duration (Calendar Days)	
If Project is still under construction, then provide percentage complete		If completed, date	
If contract time extensions were added to the contract as a result of Bidder's responsibilities, provide a short explanation of each.			
Project Description and why it is comparable to this contract.			
Project A/E Name		A/E Phone	

2.

Project Description			
Project Location		Contract Amount	Beginning $ Ending: $
Project Owner (Firm/Agency)		Address	
City		State	Zip
Project Owner's Rep familiar with project		Phone	Fax
Contract Start Date (Date of Notice to Proceed)		Contract Duration (Calendar Days)	
If Project is still under construction, then provide percentage complete		If completed, date	
If contract time extensions were added to the contract as a result of Bidder's responsibilities, provide a short explanation of each.			
Project Description and why it is comparable to this contract.			
Project A/E Name		A/E Phone	

EXPERIENCE RECORD: (CONTINUED)

3.

Project Description			
Project Location		Contract Amount	Beginning $ Ending: $
Project Owner (Firm/Agency)		Address	
City		State	Zip
Project Owner's Rep familiar with project		Phone	Fax
Contract Start Date (Date of Notice to Proceed)		Contract Duration (Calendar Days)	
If Project is still under construction, then provide percentage complete		If completed, date	
If contract time extensions were added to the contract as a result of Bidder's responsibilities, provide a short explanation of each.			
Project Description and why it is comparable to this contract.			
Project A/E Name		A/E Phone	

4.

Project Description			
Project Location		Contract Amount	Beginning $ Ending: $
Project Owner (Firm/Agency)		Address	
City		State	Zip
Project Owner's Rep familiar with project		Phone	Fax
Contract Start Date (Date of Notice to Proceed)		Contract Duration (Calendar Days)	
If Project is still under construction, then provide percentage complete		If completed, date	
If contract time extensions were added to the contract as a result of Bidder's responsibilities, provide a short explanation of each.			
Project Description and why it is comparable to this contract.			
Project A/E Name		A/E Phone	

EXPERIENCE RECORD: (CONTINUED)

5.

Project Description			
Project Location		Contract Amount	Beginning $ Ending: $
Project Owner (Firm/Agency)		Address	
City		State	Zip
Project Owner's Rep familiar with project		Phone	Fax
Contract Start Date (Date of Notice to Proceed)		Contract Duration (Calendar Days)	
If Project is still under construction, then provide percentage complete		If completed, date	
If contract time extensions were added to the contract as a result of Bidder's responsibilities, provide a short explanation of each.			
Project Description and why it is comparable to this contract.			
Project A/E Name		A/E Phone	

HUB AND TPWD CONTRACTING EXPERIENCE:

Please indicate if the firm is a Texas Certified Historically Underutilized Business (HUB): _____ YES _____ NO.
If yes, please indicate gender and ethnicity: Gender: _____ Male, _____ Female
Ethnicity _____ (*Asian Pacific Islander, Black American, Hispanic American, Native American, American Woman or Service Disabled Veteran.*)

Has firm ever done business with TPWD? _____ YES _____ NO.
If yes, list the most recent project number(s): _____

I hereby certify that all information provided above and attached is true and correct. Furthermore, I hereby authorize you to contact the references listed above and authorize release of information from such references to Texas Parks and Wildlife Department. I hereby certify that my firm is not debarred or suspended from performing work for the U.S.A. or the State of Texas.

_____ _____
Name of Firm Signature of Owner or Officer

_____ _____
Title of Person Signing Date

Comptroller of Public Accounts FORM AP-152 (Rev.8-09/13)

APPLICATION FOR TEXAS IDENTIFICATION NUMBER

• *See instructions on back*

PRINT FORM | CLEAR FORM

1. Is this a new account? ☐ YES Mail Code 000 Complete Sections 1 - 5 ☐ NO Enter Mail Code ____ Complete Sections 1, 2 & 5 Agency number ____

SECTION 1

2. **TEXAS IDENTIFICATION NUMBER (TIN) -** Indicate the type of number you are providing to be used for your TIN
   - ☐ **1** - Employer Identification Number (EIN)
   - ☐ **2** - Social Security number (SSN) Enter the number indicated ☐ ____ ☐
   - ☐ **3** - Comptroller's assigned number (FOR STATE AGENCY USE ONLY)
3. Are you currently reporting any Texas tax to the Comptroller's office such as sales tax or franchise tax?
   ☐ YES ☐ NO If "YES," enter Texas Taxpayer Number ____

SECTION 2

PAYEE INFORMATION *(Please type or print)*

4. Name of payee (Individual or business to be paid)
5. Mailing address where you want to receive payments
6. *(Optional)*
7. *(Optional)*
8. *(Optional)*
9. City State ZIP Code ____ — ____
10. Payee telephone number *(Area code and number)* (____) ____ — ____ | SIC code ____ | Security type code ____ (**0, 1, 2**) | Zone code ____

SECTION 3

11. **OWNERSHIP CODES -** Check only one code by the appropriate ownership type that applies to you or your business.

- ☐ **I** - Individual Recipient (not owning a business)
- ☐ **S** - Sole Ownership (Individual owning a business): If checked, enter the owner's name and Social Security number (SSN)
  - Owner's name ____
  - SSN ☐ 2 ____ ☐
- ☐ **P** - Partnership: If checked, enter two partner's names and Social Security numbers (SSN). If a partner is a corporation, use the corporation's Employer Identification Number (EIN).
  - Name ____
  - SSN/EIN ☐ ____ ☐
  - Name ____
  - SSN/EIN ☐ ____ ☐
- ☐ **L** - Texas Limited Partnership: If checked, enter the Texas File Number ____
- ☐ **T** - Texas Corporation: If checked, enter the Texas File Number ____
- ☐ **A** - Professional Association: If checked, enter the Texas File Number ____
- ☐ **C** - Professional Corporation: If checked, enter the Texas File Number ____
- ☐ **O** - Out-of-State Corporation
- ☐ **G** - Governmental Entity
- ☐ **U** - State agency / University
- ☐ **F** - Financial Institution
- ☐ **R** - Foreign (out of U.S.A.)
- ☐ **N** - Other: If checked, explain. ____

SECTION 4

12. Payment Assignment? ☐ YES ☐ NO *Note: A copy of the assignment agreement between payees must be attached.*
    Assignee name ____
    Assignee TIN ____ Assignment date ____

SECTION 5

13. Comments ____
14. sign here ▸ Authorized signature *(Applicant or authorized agent)* ____ Date ____
15. Agency name ____ Prepared by ____ Phone *(Area code and number)* ____

APPLICATION FOR TEXAS IDENTIFICATION NUMBER

SUSAN COMBS • TEXAS COMPTROLLER OF PUBLIC ACCOUNTS
Statewide Fiscal Services
Austin, Texas 78774-0100

WHO MUST SUBMIT THIS APPLICATION -

This application must be submitted by every person (sole owner, individual recipient, partnership, corporation or other organization) who intends to bill agencies of the state government for goods, services provided, refunds, public assistance, etc. The Texas Identification Number (TIN) will be required on all maintenance submitted by state agencies. The use of this number on all billings will reduce the time required to process billings to the State of Texas.

NOTE: To expedite processing of this application, please return the completed application to the state agency with which you are conducting business. It is not necessary for the payee to sign or complete this form. The state agency representative may complete the form for the payee.

FOR ASSISTANCE -

For assistance in completing this application, please call the State Comptroller's office at (800) 531-5441, ext. 3-3660. The Austin number is (512) 463-3660.

NOTICE TO STATE AGENCIES -

When this form is used to set up additional mail codes, Sections 1, 2 and 5 must be completed. State agencies may refer to the Texas Identification Number System (TINS) Guide at https://fmx.cpa.state.tx.us/fmx/pubs/tins/tinsguide for additional information.

GENERAL INSTRUCTIONS -

- Do not use dashes when entering Social Security, Employer Identification or Comptroller's assigned numbers.
- Disclosure of your Social Security number is required. This disclosure requirement has been adopted under the Federal Privacy Act of 1974 (5 U.S.C.A. sec. 552a(note)(West 1977), the Tax Reform Act of 1976 (42 U.S.C.A. sec. 405(c)(2)(C) (West 1992), TEX. GOV'T. CODE ANN. sec. 403.055 (Vernon 2005) and TEX. GOV'T. CODE ANN. sec. 403.056 (Vernon 2005). Your Social Security number will be used to help the Texas Comptroller of Public Accounts administer the state's tax laws and for other purposes. See Op Tex. Att'y Gen. No. H-1255 (1978).

SPECIFIC INSTRUCTIONS -

SECTION 1 - TEXAS IDENTIFICATION NUMBER

EIN: For all ownership codes other than Individual Recipient listed in Section 3, enter a 9-digit Employer Identification Number (EIN) issued by the Internal Revenue Service.

SSN: For Individual Recipient or Sole Owner without an EIN, enter your 9-digit Social Security number (SSN) issued by the Social Security Administration.

Comptroller Assigned Number: FOR STATE AGENCY USE ONLY. A Comptroller Assigned Number is an ID number that is given to a state agency that needs to pay either a foreign entity or a foreign individual who does not have an EIN or SSN.

Are you currently reporting any Texas tax to the Comptroller's office such as sales tax or franchise tax? If "YES," enter Texas Taxpayer Number.

SECTION 2 - PAYEE INFORMATION

Items 4 through 8 - Enter the complete name and mailing address where you want payments to be received. Names of individuals must be entered first name first. Each line cannot exceed 50 characters including spaces. If the name is more than 50 characters, continue the name in Item 5 and begin the address in Item 6.

Item 9 - Enter the city, state and ZIP Code.

Item 10 - Enter payee telephone number.

SIC code, Security type code and Zone code: FOR STATE AGENCY USE ONLY.

SECTION 3 - OWNERSHIP CODES

Item 11 - Check the box next to the appropriate ownership code and enter additional information as requested. Please check only one box in this section. The Secretary of State's office may be contacted at (512) 463-5555 for information regarding Texas file numbers.

SECTION 4 - PAYMENT ASSIGNMENT

Item 12 - Use when one payee is assigning payment to another payee. When setting up an assignment payment, fill out this section completely and include a copy of the assignment agreement between the assignee and the assignor.

SECTION 5 - COMMENTS AND IDENTIFICATION

Item 13 - Enter any additional information that may be helpful in processing this applicatiion. Items 14 and 15 are for identification purposes. Always complete the identification section, including comments and authorized signature.

Under Ch. 559, Government Code, you are entitled to review, request and correct information we have on file about you, with limited exceptions in accordance with Ch. 552, Government Code. To request information for review or to request error correction, contact us at the address or phone numbers listed on this form.

Infrastructure HUB Subcontracting Opportunities

Date of HUB List: May 8, 2018 **Project/Contract Number:** 128696

Description: Dickinson Marine Laboratory Flood Repairs

In accordance with Texas Administrative Code, Title 34, Part 1, Chapter 20, Subchapter D, Division 1, state agencies shall make a good faith effort to utilize Historically Underutilized Businesses (HUBs) in contracts for Construction, Services (including Professional and Consulting Services), and Commodity procurements. The State of Texas Policy is to contract directly with HUBs or indirectly through subcontracting opportunities. Each Contractor/Vendor shall also make a good faith effort to utilize HUBs in subcontracting opportunities.

TPWD estimates the value of this contract to be $ **480,000.00-550,000.00** and further sets the HUB subcontracting goal at **21.1** % of the contract's value.

(Subcontractor - A person who contracts with a vendor to work, to supply commodities, or contribute toward completing work for a governmental entity as defined in Texas Government Code 2251.001.)

CMBL Class & Item Code:	Trades/Disciplines/Major Supplies:
909-24	Building Construction, Commercial and Institutional
909-30	Building Construction(Not Otherwise Classified)
909-37	Doors and Windows
909-45	Finishes, Flooring, Wall and Ceiling
909-76	Site Work
910-06	Carpentry Maintenance and Repair of Buildings
912-40	Demolition Services
913-62	Construction, Concrete, Pouring-in-place, Form, Place, Finish
914-27	Carpentry Services, New Construction
914-30	Concrete Services, New Construction

CMBL Class & Item Code:	Trades/Disciplines/Major Supplies:
914-38	Electrical Services, New Construction
914-50	Construction Services, HVAC, New
914-55	Masonry Service, New Construction
914-58	Metal Work, Miscellaneous Metals
914-61	Construction Services, Painting New
914-68	Plumbing Services, New Construction
914-80	Construction Services, Stucco, New
990-42	Fire Alarm Installation Services
340-16	Fire Alarm Systems
926-78	Mold Remediation Services, Environmental

HUB LIST:

TPWD does not endorse, recommend or attest to the capabilities of any company or individual listed. The list is strictly provided as a convenience to respondents.

Respondents may also access a list of HUB subcontractors by referencing the above Class and Item codes in a Centralized Master Bidders List (CMBL) search at https://mycpa.cpa.state.tx.us/tpasscmblsearch/index.jsp.

Comptroller HSP information: https://www.comptroller.texas.gov/purchasing/vendor/hub/forms.php.

A few minority and women trade organizations and development centers are listed below. For a more complete list, please visit https://www.comptroller.texas.gov/purchasing/vendor/hub/resources.php.

Women's Business Enterprise Alliance 9800 Northwest Freeway, Ste. 120 Houston, TX 77092 (713) 681-9232 office (713) 681-9242 fax bids@wbea-texas.org email www.wbea-texas.org website	Texas Association of African American Chambers of Commerce 807 Brazos St., Ste. 710 Austin, TX 78701 (512) 535-5610 office info@taaacc.org email www.taaacc.org website	Texas Association of Mexican American Chambers of Commerce P.O. Box 41780 Austin, TX 78704 (512) 444-5727 office president@tamacc.org email www.tamacc.org website
Golden Triangle Minority Business Council P.O. Box 5064 Beaumont, TX 77726-5064 (409) 962-8530 office (409) 722-5402 fax hatcher.beverly@gtmbc.com email www.gtmbc.com website	Asian Contractor Association 4201 Ed Bluestein Blvd. #2105 Austin, TX 78721 (512) 926-5400 office (512) 926-5410 fax asiancontractor@gmail.com email www.acta-austin.com website	Women's Business Council - Southwest 2201 N. Collins, Ste. 158 Arlington, TX 76011 (817) 299-0566 office (817) 299-0949 fax lwilliams@wbcsouthwest.org email www.wbcsouthwest.org website

For information on the TPWD HUB program, assistance with completing forms, or to obtain HUB lists if web access is not possible, please contact the TPWD HUB staff at (512) 389-4784 or hub@tpwd.texas.gov.

Rev. 2/17

HUB Subcontracting Plan (HSP)

QUICK CHECKLIST

While this HSP Quick Checklist is being provided to merely assist you in readily identifying the sections of the HSP form that you will need to complete, it is very important that you adhere to the instructions in the HSP form and instructions provided by the contracting agency.

➤ **If you will be awarding <u>all</u> of the subcontracting work you have to offer under the contract to <u>only</u> Texas certified HUB vendors, complete:**

- ☐ Section 1 - Respondent and Requisition Information
- ☐ Section 2 a. - Yes, I will be subcontracting portions of the contract.
- ☐ Section 2 b. - List all the portions of work you will subcontract, and indicate the percentage of the contract you expect to award to Texas certified HUB vendors.
- ☐ Section 2 c. - Yes
- ☐ Section 4 - Affirmation
- ☐ GFE Method A (Attachment A) - Complete an Attachment A for each of the subcontracting opportunities you listed in Section 2 b.

➤ **If you will be subcontracting any portion of the contract to Texas certified HUB vendors and Non-HUB vendors, and the aggregate percentage of all the subcontracting work you will be awarding to the Texas certified HUB vendors with which you <u>do not</u> have a *<u>continuous contract</u>** in place for more than five (5) years *<u>meets or exceeds</u>* the HUB Goal the contracting agency identified in the "Agency Special Instructions/Additional Requirements", complete:**

- ☐ Section 1 - Respondent and Requisition Information
- ☐ Section 2 a. - Yes, I will be subcontracting portions of the contract.
- ☐ Section 2 b. - List all the portions of work you will subcontract, and indicate the percentage of the contract you expect to award to Texas certified HUB vendors and Non-HUB vendors.
- ☐ Section 2 c. - No
- ☐ Section 2 d. - Yes
- ☐ Section 4 - Affirmation
- ☐ GFE Method A (Attachment A) - Complete an Attachment A for each of the subcontracting opportunities you listed in Section 2 b.

➤ **If you will be subcontracting any portion of the contract to Texas certified HUB vendors and Non-HUB vendors or only to Non-HUB vendors, and the aggregate percentage of all the subcontracting work you will be awarding to the Texas certified HUB vendors with which you <u>do not</u> have a *<u>continuous contract</u>** in place for more than five (5) years *<u>does not meet or exceed</u>* the HUB Goal the contracting agency identified in the "Agency Special Instructions/Additional Requirements", complete:**

- ☐ Section 1 - Respondent and Requisition Information
- ☐ Section 2 a. - Yes, I will be subcontracting portions of the contract.
- ☐ Section 2 b. - List all the portions of work you will subcontract, and indicate the percentage of the contract you expect to award to Texas certified HUB vendors and Non-HUB vendors.
- ☐ Section 2 c. - No
- ☐ Section 2 d. - No
- ☐ Section 4 - Affirmation
- ☐ GFE Method B (Attachment B) - Complete an Attachment B for each of the subcontracting opportunities you listed in Section 2 b.

➤ **If you will not be subcontracting any portion of the contract and will be fulfilling the entire contract with your own resources (i.e., employees, supplies, materials and/or equipment), complete:**

- ☐ Section 1 - Respondent and Requisition Information
- ☐ Section 2 a. - No, I will not be subcontracting any portion of the contract, and I will be fulfilling the entire contract with my own resources.
- ☐ Section 3 - Self Performing Justification
- ☐ Section 4 - Affirmation

***<u>Continuous Contract</u>:** Any existing written agreement (including any renewals that are exercised) between a prime contractor and a HUB vendor, where the HUB vendor provides the prime contractor with goods or service, to include under the same contract for a specified period of time. The frequency the HUB vendor is utilized or paid during the term of the contract is not relevant to whether the contract is considered continuous. Two or more contracts that run concurrently or overlap one another for different periods of time are considered by CPA to be individual contracts rather than renewals or extensions to the original contract. In such situations the prime contractor and HUB vendor are entering (have entered) into "new" contracts.*

HUB Subcontracting Plan (HSP)

In accordance with Texas Gov't Code §2161.252, the contracting agency has determined that subcontracting opportunities are probable under this contract. Therefore, all respondents, including State of Texas certified Historically Underutilized Businesses (HUBs) must complete and submit this State of Texas HUB Subcontracting Plan (HSP) with their response to the bid requisition (solicitation).

NOTE: Responses that do not include a completed HSP shall be rejected pursuant to Texas Gov't Code §2161.252(b).

The HUB Program promotes equal business opportunities for economically disadvantaged persons to contract with the State of Texas in accordance with the goals specified in the 2009 State of Texas Disparity Study. The statewide HUB goals defined in 34 Texas Administrative Code (TAC) §20.284 are:

- ***11.2 percent for heavy construction other than building contracts,***
- ***21.1 percent for all building construction, including general contractors and operative builders' contracts,***
- ***32.9 percent for all special trade construction contracts,***
- ***23.7 percent for professional services contracts,***
- ***26.0 percent for all other services contracts, and***
- ***21.1 percent for commodities contracts.***

- - Agency Special Instructions/Additional Requirements - -

*In accordance with 34 TAC §20.285(d)(1)(D)(iii), a respondent (prime contractor) may demonstrate good faith effort to utilize Texas certified HUBs for its subcontracting opportunities if the total value of the respondent's subcontracts with Texas certified HUBs meets or exceeds the statewide HUB goal or the agency specific HUB goal, whichever is higher. When a respondent uses this method to demonstrate good faith effort, the respondent must identify the HUBs with which it will subcontract. If using existing contracts with Texas certified HUBs to satisfy this requirement, only the aggregate percentage of the contracts expected to be subcontracted to HUBs with which the respondent **does not** have a **continuous contract*** in place for **more than five (5) years** shall qualify for meeting the HUB goal. This limitation is designed to encourage vendor rotation as recommended by the 2009 Texas Disparity Study.*

If you are completing Method B (Attachment B) of the HSP, please provide all supporting documentation pertaining to the notifications of a minimum of three (3) Texas-certified HUBs and two (2) minority, women, or service-disabled veteran trade organizations or development centers for each subcontracting opportunity listed in Section 2, Item b. Such supporting documentation would include all e-mails, faxes, delivery receipts, confirmation receipts/pages, attachments, etc.

For questions regarding the HSP, please contact TPWD HUB Administration at 512-389-4784 or hub@tpwd.texas.gov.

SECTION 1: RESPONDENT AND REQUISITION INFORMATION

a. Respondent (Company) Name: _____ State of Texas VID #: _____

Point of Contact: _____ Phone #: _____

E-mail Address: _____ Fax #: _____

b. Is your company a State of Texas certified HUB? ☐ **- Yes** ☐ **- No**

c. Requisition #: _____ Bid Open Date: _____ (mm/dd/yyyy)

Enter your company's name here: _____ Requisition #: _____

SECTION 2: RESPONDENT'S SUBCONTRACTING INTENTIONS

After dividing the contract work into reasonable lots or portions to the extent consistent with prudent industry practices, and taking into consideration the scope of work to be performed under the proposed contract, including all potential subcontracting opportunities, the respondent must determine what portions of work, **including contracted staffing, goods and services will be subcontracted**. Note: In accordance with 34 TAC §20.282, a "Subcontractor" means a person who contracts with a prime contractor to work, to supply commodities, or to contribute toward completing work for a governmental entity.

a. Check the appropriate box (Yes or No) that identifies your subcontracting intentions:

☐ - *Yes*, I will be subcontracting portions of the contract. (If *Yes*, complete Item b of this SECTION and continue to Item c of this SECTION.)

☐ - *No*, I will not be subcontracting any portion of the contract, and I will be fulfilling the entire contract with my own resources, including employees, goods and services. (If *No*, continue to SECTION 3 and SECTION 4.)

b. List all the portions of work (subcontracting opportunities) you will subcontract. Also, based on the total value of the contract, identify the percentages of the contract you expect to award to Texas certified HUBs, and the percentage of the contract you expect to award to vendors that are not a Texas certified HUB (i.e., Non-HUB).

Item #	Subcontracting Opportunity Description	HUBs		Non-HUBs
		Percentage of the contract expected to be subcontracted to HUBs with which you do not have a continuous contract* in place for more than five (5) years.	**Percentage of the contract expected to be subcontracted to HUBs with which you have a continuous contract* in place for more than five (5) years.**	Percentage of the contract expected to be subcontracted to non-HUBs.
1		%	%	%
2		%	%	%
3		%	%	%
4		%	%	%
5		%	%	%
6		%	%	%
7		%	%	%
8		%	%	%
9		%	%	%
10		%	%	%
11		%	%	%
12		%	%	%
13		%	%	%
14		%	%	%
15		%	%	%
	Aggregate percentages of the contract expected to be subcontracted:	**%**	**%**	**%**

(Note: If you have more than fifteen subcontracting opportunities, a continuation sheet is available online at https://www.comptroller.texas.gov/purchasing/vendor/hub/forms.php).

c. Check the appropriate box (Yes or No) that indicates whether you will be using **only** Texas certified HUBs to perform **all** of the subcontracting opportunities you listed in SECTION 2, Item b.

☐ - *Yes* (If *Yes*, continue to SECTION 4 and complete an "HSP Good Faith Effort - Method A (Attachment A)" for **each** of the subcontracting opportunities you listed.)

☐ - *No* (If *No*, continue to Item d, of this SECTION.)

d. Check the appropriate box (Yes or No) that indicates whether the aggregate expected percentage of the contract you will subcontract **with Texas certified HUBs** with which you **do not** have a **continuous contract*** in place with for **more than five (5) years**, **meets or exceeds** the HUB goal the contracting agency identified on page 1 in the "**Agency Special Instructions/Additional Requirements**."

☐ - *Yes* (If *Yes*, continue to SECTION 4 and complete an "HSP Good Faith Effort - Method A (Attachment A)" for **each** of the subcontracting opportunities you listed.)

☐ - *No* (If *No*, continue to SECTION 4 and complete an "HSP Good Faith Effort - Method B (Attachment B)" for **each** of the subcontracting opportunities you listed.)

***Continuous Contract**: Any existing written agreement (including any renewals that are exercised) between a prime contractor and a HUB vendor, where the HUB vendor provides the prime contractor with goods or service under the same contract for a specified period of time. The frequency the HUB vendor is utilized or paid during the term of the contract is not relevant to whether the contract is considered continuous. Two or more contracts that run concurrently or overlap one another for different periods of time are considered by CPA to be individual contracts rather than renewals or extensions to the original contract. In such situations the prime contractor and HUB vendor are entering (have entered) into "new" contracts.*

Enter your company's name here: _____ Requisition #: _____

SECTION 2: RESPONDENT's SUBCONTRACTING INTENTIONS (CONTINUATION SHEET)

This page can be used as a continuation sheet to the HSP Form's page 2, Section 2, Item b. Continue listing the portions of work (subcontracting opportunities) you will subcontract. Also, based on the total value of the contract, identify the percentages of the contract you expect to award to Texas certified HUBs, and the percentage of the contract you expect to award to vendors that are not a Texas certified HUB (i.e., Non-HUB).

Item #	Subcontracting Opportunity Description	HUBs		Non-HUBs
		Percentage of the contract expected to be subcontracted to HUBs with which you do not have a continuous contract* in place for more than five (5) years.	**Percentage of the contract expected to be subcontracted to HUBs with which you have a continuous contract* in place for more than five (5) years.**	**Percentage of the contract expected to be subcontracted to non-HUBs.**
16		%	%	%
17		%	%	%
18		%	%	%
19		%	%	%
20		%	%	%
21		%	%	%
22		%	%	%
23		%	%	%
24		%	%	%
25		%	%	%
26		%	%	%
27		%	%	%
28		%	%	%
29		%	%	%
30		%	%	%
31		%	%	%
32		%	%	%
33		%	%	%
34		%	%	%
35		%	%	%
36		%	%	%
37		%	%	%
38		%	%	%
39		%	%	%
40		%	%	%
41		%	%	%
42		%	%	%
43		%	%	%
	Aggregate percentages of the contract expected to be subcontracted:	**%**	**%**	**%**

***Continuous Contract**: Any existing written agreement (including any renewals that are exercised) between a prime contractor and a HUB vendor, where the HUB vendor provides the prime contractor with goods or service under the same contract for a specified period of time. The frequency the HUB vendor is utilized or paid during the term of the contract is not relevant to whether the contract is considered continuous. Two or more contracts that run concurrently or overlap one another for different periods of time are considered by CPA to be individual contracts rather than renewals or extensions to the original contract. In such situations the prime contractor and HUB vendor are entering (have entered) into "new" contracts.*

Enter your company's name here: _____ Requisition #: _____

SECTION 3: SELF PERFORMING JUSTIFICATION (If you responded "No" to SECTION 2, Item a, you must complete this SECTION and continue to SECTION 4.) If you responded "No" to SECTION 2, Item a, in the space provided below **explain how** your company will perform the entire contract with its own employees, supplies, materials and/or equipment.

SECTION 4: AFFIRMATION

As evidenced by my signature below, I affirm that I am an authorized representative of the respondent listed in SECTION 1, and that the information and supporting documentation submitted with the HSP is true and correct. Respondent understands and agrees that, if awarded any portion of the requisition:

- The respondent will provide notice as soon as practical to all the subcontractors (HUBs and Non-HUBs) of their selection as a subcontractor for the awarded contract. The notice must specify at a minimum the contracting agency's name and its point of contact for the contract, the contract award number, the subcontracting opportunity they (the subcontractor) will perform, the approximate dollar value of the subcontracting opportunity and the expected percentage of the total contract that the subcontracting opportunity represents. A copy of the notice required by this section must also be provided to the contracting agency's point of contact for the contract no later than ten (10) working days after the contract is awarded.
- The respondent must submit monthly compliance reports (Prime Contractor Progress Assessment Report – PAR) to the contracting agency, verifying its compliance with the HSP, including the use of and expenditures made to its subcontractors (HUBs and Non-HUBs). (The PAR is available at https://www.comptroller.texas.gov/purchasing/docs/hub-forms/ProgressAssessmentReportForm.xls).
- The respondent must seek approval from the contracting agency prior to making any modifications to its HSP, including the hiring of additional or different subcontractors and the termination of a subcontractor the respondent identified in its HSP. If the HSP is modified without the contracting agency's prior approval, respondent may be subject to any and all enforcement remedies available under the contract or otherwise available by law, up to and including debarment from all state contracting.
- The respondent must, upon request, allow the contracting agency to perform on-site reviews of the company's headquarters and/or work-site where services are being performed and must provide documentation regarding staffing and other resources.

Signature	Printed Name	Title	Date (mm/dd/yyyy)

Reminder:

- If you responded "Yes" to SECTION 2, Items c or d, you must complete an "HSP Good Faith Effort - Method A (Attachment A)" for each of the subcontracting opportunities you listed in SECTION 2, Item b.
- If you responded "No" SECTION 2, Items c and d, you must complete an "HSP Good Faith Effort - Method B (Attachment B)" for each of the subcontracting opportunities you listed in SECTION 2, Item b.

HSP Good Faith Effort - Method A (Attachment A)

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Enter your company's name here: ______________________________ Requisition #: ______________

IMPORTANT: If you responded "*Yes*" to **SECTION 2, Items c** or **d** of the completed HSP form, you must submit a completed "HSP Good Faith Effort - Method A (Attachment A)" for each of the subcontracting opportunities you listed in **SECTION 2, Item b** of the completed HSP form. You may photo-copy this page or download the form at https://www.comptroller.texas.gov/purchasing/docs/hub-forms/hub-sbcont-plan-gfe-achm-a.pdf

SECTION A-1: SUBCONTRACTING OPPORTUNITY

Enter the item number and description of the subcontracting opportunity you listed in SECTION 2, Item b, of the completed HSP form for which you are completing the attachment.

Item Number: _____ Description: ______________________________

SECTION A-2: SUBCONTRACTOR SELECTION

List the subcontractor(s) you selected to perform the subcontracting opportunity you listed above in SECTION A-1. Also identify whether they are a Texas certified HUB and their Texas Vendor Identification (VID) Number or federal Employer Identification Number (EIN), the approximate dollar value of the work to be subcontracted, and the expected percentage of work to be subcontracted. When searching for Texas certified HUBs and verifying their HUB status, ensure that you use the State of Texas' Centralized Master Bidders List (CMBL) - Historically Underutilized Business (HUB) Directory Search located at http://mycpa.cpa.state.tx.us/tpasscmblsearch/index.jsp. HUB status code "**A**" signifies that the company is a Texas certified HUB.

Company Name	Texas certified HUB	Texas VID or federal EIN Do not enter Social Security Numbers. If you do not know their VID / EIN, leave their VID / EIN field blank.	Approximate Dollar Amount	Expected Percentage of Contract
	☐ - Yes ☐ - No		$	%
	☐ - Yes ☐ - No		$	%
	☐ - Yes ☐ - No		$	%
	☐ - Yes ☐ - No		$	%
	☐ - Yes ☐ - No		$	%
	☐ - Yes ☐ - No		$	%
	☐ - Yes ☐ - No		$	%
	☐ - Yes ☐ - No		$	%
	☐ - Yes ☐ - No		$	%
	☐ - Yes ☐ - No		$	%
	☐ - Yes ☐ - No		$	%
	☐ - Yes ☐ - No		$	%
	☐ - Yes ☐ - No		$	%
	☐ - Yes ☐ - No		$	%
	☐ - Yes ☐ - No		$	%
	☐ - Yes ☐ - No		$	%
	☐ - Yes ☐ - No		$	%
	☐ - Yes ☐ - No		$	%
	☐ - Yes ☐ - No		$	%
	☐ - Yes ☐ - No		$	%
	☐ - Yes ☐ - No		$	%
	☐ - Yes ☐ - No		$	%
	☐ - Yes ☐ - No		$	%

REMINDER: As specified in SECTION 4 of the completed HSP form, if you (respondent) are awarded any portion of the requisition, you are required to provide notice as soon as practical to all the subcontractors (HUBs and Non-HUBs) of their selection as a subcontractor. The notice must specify at a minimum the contracting agency's name and its point of contact for the contract, the contract award number, the subcontracting opportunity they (the subcontractor) will perform, the approximate dollar value of the subcontracting opportunity and the expected percentage of the total contract that the subcontracting opportunity represents. A copy of the notice required by this section must also be provided to the contracting agency's point of contact for the contract no later than ten (10) working days after the contract is awarded.

HSP Good Faith Effort - Method B (Attachment B)

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Enter your company's name here: _____ Requisition #: _____

IMPORTANT*:** If you responded "No***" to **SECTION 2, Items c** and **d** of the completed HSP form, you must submit a completed "HSP Good Faith Effort - Method B (Attachment B)" for **each** of the subcontracting opportunities you listed in **SECTION 2, Item b** of the completed HSP form. You may photo-copy this page or download the form at https://www.comptroller.texas.gov/purchasing/docs/hub-forms/hub-sbcont-plan-gfe-achm-b.pdf..

SECTION B-1: SUBCONTRACTING OPPORTUNITY

Enter the item number and description of the subcontracting opportunity you listed in SECTION 2, Item b, of the completed HSP form for which you are completing the attachment.

Item Number: _____ Description: _____

SECTION B-2: MENTOR PROTÉGÉ PROGRAM

If respondent is participating as a Mentor in a State of Texas Mentor Protégé Program, submitting its Protégé (Protégé must be a State of Texas certified HUB) as a subcontractor to perform the subcontracting opportunity listed in **SECTION B-1**, constitutes a good faith effort to subcontract with a Texas certified HUB towards that specific portion of work.

Check the appropriate box (Yes or No) that indicates whether you will be subcontracting the portion of work you listed in SECTION B-1 to your Protégé.

☐ - Yes (If *Yes*, continue to SECTION B-4.)

☐ - No / Not Applicable (If *No* or *Not Applicable*, continue to SECTION B-3 and SECTION B-4.)

SECTION B-3: NOTIFICATION OF SUBCONTRACTING OPPORTUNITY

When completing this section you MUST comply with items a, b, c and d, thereby demonstrating your Good Faith Effort of having notified Texas certified HUBs and trade organizations or development centers about the subcontracting opportunity you listed in SECTION B-1. Your notice should include the scope of work, information regarding the location to review plans and specifications, bonding and insurance requirements, required qualifications, and identify a contact person. When sending notice of your subcontracting opportunity, you are encouraged to use the attached HUB Subcontracting Opportunity Notice form, which is also available online at https://www.comptroller.texas.gov/purchasing/docs/hub-forms/HUBSubcontractingOpportunityNotificationForm.pdf.

Retain supporting documentation (i.e., certified letter, fax, e-mail) demonstrating evidence of your good faith effort to notify the Texas certified HUBs and trade organizations or development centers. Also, be mindful that a working day is considered a normal business day of a state agency, not including weekends, federal or state holidays, or days the agency is declared closed by its executive officer. The initial day the subcontracting opportunity notice is sent/provided to the HUBs and to the trade organizations or development centers is considered to be "day zero" and does not count as one of the seven (7) working days.

a. Provide written notification of the subcontracting opportunity you listed in SECTION B-1, to three (3) or more Texas certified HUBs. Unless the contracting agency specified a different time period, you must allow the HUBs at least seven (7) working days to respond to the notice prior to you submitting your bid response to the contracting agency. When searching for Texas certified HUBs and verifying their HUB status, ensure that you use the State of Texas' Centralized Master Bidders List (CMBL) - Historically Underutilized Business (HUB) Directory Search located at http://mycpa.cpa.state.tx.us/tpasscmblsearch/index.jsp. HUB status code "**A**" signifies that the company is a Texas certified HUB.

b. List the **three (3) Texas certified HUBs** you notified regarding the subcontracting opportunity you listed in SECTION B-1. Include the company's Texas Vendor Identification (VID) Number, the date you sent notice to that company, and indicate whether it was responsive or non-responsive to your subcontracting opportunity notice.

Company Name	Texas VID (Do not enter Social Security Numbers.)	Date Notice Sent (mm/dd/yyyy)	Did the HUB Respond?
			☐ - Yes ☐ - No
			☐ - Yes ☐ - No
			☐ - Yes ☐ - No

c. Provide written notification of the subcontracting opportunity you listed in SECTION B-1 to two (2) or more trade organizations or development centers in Texas to assist in identifying potential HUBs by disseminating the subcontracting opportunity to their members/participants. Unless the contracting agency specified a different time period, you must provide your subcontracting opportunity notice to trade organizations or development centers at least seven (7) working days prior to submitting your bid response to the contracting agency. A list of trade organizations and development centers that have expressed an interest in receiving notices of subcontracting opportunities is available on the Statewide HUB Program's webpage at https://www.comptroller.texas.gov/purchasing/vendor/hub/resources.php.

d. List **two (2) trade organizations or development centers** you notified regarding the subcontracting opportunity you listed in SECTION B-1. Include the date when you sent notice to it and indicate if it accepted or rejected your notice.

Trade Organizations or Development Centers	Date Notice Sent (mm/dd/yyyy)	Was the Notice Accepted?
		☐ - Yes ☐ - No
		☐ - Yes ☐ - No

HSP Good Faith Effort - Method B (Attachment B) Cont.

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Enter your company's name here: _____ Requisition #: _____

SECTION B-4: SUBCONTRACTOR SELECTION

Enter the item number and description of the subcontracting opportunity you listed in **SECTION 2, Item b,** of the completed HSP form for which you are completing the attachment.

a. Enter the item number and description of the subcontracting opportunity for which you are completing this Attachment B continuation page.

Item Number: _____ Description: _____

b. List the subcontractor(s) you selected to perform the subcontracting opportunity you listed in **SECTION B-1**. Also identify whether they are a Texas certified HUB and their Texas Vendor Identification (VID) Number or federal Emplioyer Identification Number (EIN), the approximate dollar value of the work to be subcontracted, and the expected percentage of work to be subcontracted. When searching for Texas certified HUBs and verifying their HUB status, ensure that you use the State of Texas' Centralized Master Bidders List (CMBL) - Historically Underutilized Business (HUB) Directory Search located at http://mycpa.cpa.state.tx.us/tpasscmblsearch/index.jsp. HUB status code "**A**" signifies that the company is a Texas certified HUB.

Company Name	Texas certified HUB	Texas VID or federal EIN Do not enter Social Security Numbers. If you do not know their VID / EIN, leave their VID / EIN field blank.	Approximate Dollar Amount	Expected Percentage of Contract
	☐ - Yes ☐ - No		$	%
	☐ - Yes ☐ - No		$	%
	☐ - Yes ☐ - No		$	%
	☐ - Yes ☐ - No		$	%
	☐ - Yes ☐ - No		$	%
	☐ - Yes ☐ - No		$	%
	☐ - Yes ☐ - No		$	%
	☐ - Yes ☐ - No		$	%
	☐ - Yes ☐ - No		$	%
	☐ - Yes ☐ - No		$	%

c. If any of the subcontractors you have selected to perform the subcontracting opportunity you listed in **SECTION B-1** is **not** a Texas certified HUB, provide written justification for your selection process (attach additional page if necessary):

REMINDER: As specified in SECTION 4 of the completed HSP form, if you (respondent) are awarded any portion of the requisition, you are required to provide notice as soon as practical to **all** the subcontractors (HUBs and Non-HUBs) of their selection as a subcontractor. The notice must specify at a minimum the contracting agency's name and its point of contact for the contract, the contract award number, the subcontracting opportunity it (the subcontractor) will perform, the approximate dollar value of the subcontracting opportunity and the expected percentage of the total contract that the subcontracting opportunity represents. A copy of the notice required by this section must also be provided to the contracting agency's point of contact for the contract no later than ten (10) working days after the contract is awarded.

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HUB Subcontracting Opportunity Notification Form

In accordance with Texas Gov't Code, Chapter 2161, each state agency that considers entering into a contract with an expected value of $100,000 or more shall, before the agency solicits bids, proposals, offers, or other applicable expressions of interest, determine whether subcontracting opportunities are probable under the contract. The state agency I have identified below in Section B has determined that subcontracting opportunities are probable under the requisition to which my company will be responding.

34 Texas Administrative Code, §20.285 requires all respondents (prime contractors) bidding on the contract to provide notice of each of their subcontracting opportunities to at least three (3) Texas certified HUBs (who work within the respective industry applicable to the subcontracting opportunity), and allow the HUBs at least seven (7) working days to respond to the notice prior to the respondent submitting its bid response to the contracting agency. In addition, at least seven (7) working days prior to submitting its bid response to the contracting agency, the respondent must provide notice of each of its subcontracting opportunities to two (2) or more trade organizations or development centers (in Texas) that serves members of groups (i.e., Asian Pacific American, Black American, Hispanic American, Native American, Woman, Service Disabled Veteran) identified in Texas Administrative Code §20.282(19)(C).

We respectfully request that vendors interested in bidding on the subcontracting opportunity scope of work identified in Section C, Item 2, reply no later than the date and time identified in Section C, Item 1. Submit your response to the point-of-contact referenced in Section A.

SECTION A: PRIME CONTRACTOR'S INFORMATION

Company Name: _____ State of Texas VID #: _____

Point-of-Contact: _____ Phone #: _____

E-mail Address: _____ Fax #: _____

SECTION B: CONTRACTING STATE AGENCY AND REQUISITION INFORMATION

Agency Name: _____

Point-of-Contact: _____ Phone #: _____

Requisition #: _____ Bid Open Date: _____ (mm/dd/yyyy)

SECTION C: SUBCONTRACTING OPPORTUNITY RESPONSE DUE DATE, DESCRIPTION, REQUIREMENTS AND RELATED INFORMATION

1. Potential Subcontractor's Bid Response Due Date:

If you would like for our company to consider your company's bid for the subcontracting opportunity identified below in Item 2,

we must receive your bid response no later than _____ (Central Time) on _____ (Date (mm/dd/yyyy)).

In accordance with 34 TAC §20.285, each notice of subcontracting opportunity shall be provided to at least three (3) Texas certified HUBs, and allow the HUBs at least seven (7) working days to respond to the notice prior to submitting our bid response to the contracting agency. In addition, at least seven (7) working days prior to us submitting our bid response to the contracting agency, we must provide notice of each of our subcontracting opportunities to two (2) or more trade organizations or development centers (in Texas) that serves members of groups (i.e., Asian Pacific American, Black American, Hispanic American, Native American, Woman, Service Disabled Veteran) identified in Texas Administrative Code, §20.282(19)(C).

(A working day is considered a normal business day of a state agency, not including weekends, federal or state holidays, or days the agency is declared closed by its executive officer. The initial day the subcontracting opportunity notice is sent/provided to the HUBs and to the trade organizations or development centers is considered to be "day zero" and does not count as one of the seven (7) working days.)

2. Subcontracting Opportunity Scope of Work:

3. Required Qualifications: ☐ - Not Applicable

4. Bonding/Insurance Requirements: ☐ - Not Applicable

5. Location to review plans/specifications: ☐ - Not Applicable

CONDITIONS OF THE CONTRACT

Uniform General Conditions for State of Texas Construction Contracts

Including

Supplementary General Conditions for Projects Administered by the Texas Parks and Wildlife Department

Table of Contents

Article 1. Definitions

Unless the context clearly requires another meaning, the following terms have the meaning assigned herein.

1.1 *Addendum/Addenda* means formally issued written or graphic modifications and/or interpretations of the Construction Documents that may add to, delete from, clarify or correct the description and/or scope of the Work. Addenda are issued during the bidding phase of the project.

1.2 *Application for Payment* means Contractor's monthly partial invoice for payment that includes any portion of the Work that has been completed for which an invoice has not been submitted and performed in accordance with the requirements of the Contract Documents. The Application for Payment accurately reflects the progress of the Work, is itemized based on the Schedule of Values, bears the notarized signature of Contractor, and shall not include subcontracted items for which Contractor does not intend to pay.

1.3 *Application for Final Payment* means Contractor's final invoice for payment that includes any portion of the Work that has been completed for which an invoice has not been submitted, amounts owing to adjustments to the final Contract Sum resulting from approved change orders, and release of remaining Contractor's retainage.

1.4 *Architect/Engineer (A/E)* means a person registered as an architect pursuant to Tex. Occ. Code Ann., Ch. 1051, as a landscape architect pursuant to Tex. Occ. Code Ann., Ch. 1052, a person licensed as a professional engineer pursuant Tex. Occ. Code Ann., Ch. 1001, and/or a firm employed by Owner or Design-Build Contractor to provide professional architectural or engineering services and to exercise overall responsibility for the design of a Project or a significant portion thereof, and to perform the contract administration responsibilities set forth in the Contract.

1.5 ***As-Built Drawings and Specifications* means the drawing set, specifications and other materials prepared by the Contractor, in the field, that documents the changes made by the contractor. Collectively, these are also called "red-lines" or "as-builts."**

1.6 *Authority Having Jurisdiction* means a federal, state, local, or other regional department, or an individual such as a fire marshal, building official, electrical inspector, utility provider or other individual having statutory authority.

1.7 *Baseline Schedule* means the initial time schedule prepared by Contractor for Owner's information and acceptance that conveys Contractor's and Subcontractors' activities (including coordination and review activities required in the Contract Documents to be performed by A/E and ODR), durations, and sequence of work related to the entire Project to the extent required by the Contract Documents. The schedule clearly demonstrates the critical path of activities, durations and necessary predecessor conditions that drive the end date of the schedule. The Baseline Schedule shall not exceed the time limit current under the Contract Documents.

1.8 *Certificate of Final Completion* means the certificate issued by ***TPWD that includes certification*** by ***the*** A/E that documents, to the best of A/E's knowledge and understanding, Contractor's completion of all Contractor's Punchlist items and pre-final Punchlist items, final cleanup and Contractor's provision of ~~Record~~ ***As-Built*** Documents, operations and maintenance manuals, and all other closeout documents required by the Contract Documents. ***Additional documentation may be required by TPWD for consideration of the Contractor's Application for Final Payment.***

1.9 *Certificate of Substantial Completion* means the certificate executed by the A/E, ODR and Contractor that documents to the best of A/E's and ODR's knowledge and understanding, Contractor's sufficient completion of the work in accordance with the Contract, so as to be operational and fit for the use intended.

1.10 *Change Order* means a written modification of the Contract between Owner and Contractor, signed by Owner, Contractor, and A/E.

1.11 *Close-out Documents* mean the product brochures, submittals, product/equipment maintenance and operations instructions, manuals, and other documents/warranties, ~~record~~ ***As-Built*** documents, affidavit of payment, release of lien and claim, and as may be further defined, identified, and required by the Contract Documents.

1.12 *Contract* means the entire agreement between Owner and Contractor, including all of the Contract Documents.

1.13 *Contract Date* is the date when the agreement between Owner and Contractor becomes effective.

1.14 *Contract Documents* mean those documents identified as a component of the agreement (Contract) between Owner and Contractor. These may include, but are not limited to, Drawings; Specifications; General, Supplementary General, and Special Conditions; and all pre-bid and/or pre-proposal addenda.

1.15 *Contract Sum* means the total compensation payable to Contractor for completion of the Work in accordance with the terms of the Contract.

1.16 *Contract Time* means the period between the start date identified in the Notice to Proceed with construction and the Substantial Completion date identified in the Notice to Proceed or as subsequently amended by a Change Order.

1.17 *Contractor* means the individual, corporation, limited liability company, partnership, firm, or other entity contracted to perform the Work, regardless of the type of construction contract used, so that the term as used herein includes a Construction Manager-at-Risk or a Design-Build firm as well as a general or prime Contractor. The Contract Documents refer to Contractor as if singular in number.

1.18 *Construction Documents* mean the Drawings, Specifications, and other documents issued to build the Project. Construction Documents become part of the Contract Documents when listed in the Contract or any Change Order.

1.19 *Construction Manager-at-Risk*, in accordance with Tex. Gov't Code, Ch. 2166, means a sole proprietorship, partnership, corporation, or other legal entity that assumes the risk for construction, rehabilitation, alteration, or repair of a facility at the contracted price as a general contractor and provides consultation to Owner regarding construction during and after the design of the facility.

1.20 *Date of Commencement* means the date designated in the Notice to Proceed for Contractor to commence the Work.

1.21 *Day* means a calendar day unless otherwise specifically stipulated.

1.22 *Design-Build* means a project delivery method in which the detailed design and subsequent construction is provided through a single contract with a Design-Build firm; a team, partnership, or legal entity that includes design professionals and a builder. The Design-Build Project delivery shall be implemented in accordance with Tex. Gov't Code § 2166.2531.

1.23 *Drawings* mean that product of A/E which graphically depicts the Work.

1.24 *Final Completion* means the date determined and certified by A/E and Owner on which the Work is fully and satisfactorily complete in accordance with the Contract.

1.25 *Final Payment* means the last and final monetary compensation made to Contractor for any portion of the Work that has been completed and accepted for which payment has not been made, amounts owing to adjustments to the final Contract Sum resulting from approved change orders, and release of Contractor's retainage.

1.26 *Historically Underutilized Business (HUB)* pursuant to Tex. Gov't Code, Ch. 2161, means a business that is at least 51% owned by an Asian Pacific American, a Black American, a Hispanic American, a Native American and/or an American Woman; is an entity with its principal place of business in Texas; and has an owner residing in Texas with proportionate interest that actively participates in the control, operations, and management of the entity's affairs.

1.27 *Notice to Proceed (NTP)* means written document informing Contractor of the dates beginning Work and the dates anticipated for Substantial Completion.

1.28 *Open Item List* means a list of work activities, Punchlist items, changes or other issues that are not expected by Owner and Contractor to be complete prior to Substantial Completion.

1.29 *Owner* means the State of Texas, and any agency of the State of Texas, acting through the responsible entity of the State of Texas identified in the Contract as Owner. ***Owner herein shall mean the Texas Parks and Wildlife Department.***

1.30 *Owner's Designated Representative (ODR)* means the individual assigned by Owner to act on its behalf and to undertake certain activities as specifically outlined in the Contract. ODR is the only party authorized to direct changes to the scope, cost, or

time of the Contract.

1.31 *Project* means all activities necessary for realization of the Work. This includes design, contract award(s), execution of the Work itself, and fulfillment of all Contract and warranty obligations.

1.32 *Progress Assessment Report (PAR)* means the monthly compliance report to Owner verifying compliance with the HUB subcontracting plan (HSP).

1.33 *Proposed Change Order (PCO)* means a document that informs Contractor of a proposed change in the Work and appropriately describes or otherwise documents such change including Contractor's response of pricing for the proposed change.

1.34 *Punchlist* means a list of ***minor*** items of Work to be completed or corrected by Contractor after Substantial Completion. Punchlists indicate ***minor*** items to be finished, remaining Work to be performed, or Work that does not meet quality or quantity requirements as required in the Contract Documents.

1.35 *Record Documents* mean the drawing set, Specifications, and other materials ~~maintained~~ ***produced*** by ***the A/E of Record*** ~~Contractor~~ that documents all addenda, Architect's Supplemental Instructions, Change Orders, ~~and~~ postings and markings that record the as-constructed conditions of the Work and all changes made during construction. ***The Record Documents are produced using the As-Built Drawings and Specifications as provided by the Contractor, and any As-Built documents produced by the A/E of Record during the course of the construction.***

1.36 *Request for Information (RFI)* means a written request by Contractor directed to A/E or ODR for a clarification of the information provided in the Contract Documents or for direction concerning information necessary to perform the Work that may be omitted from the Contract Documents.

1.37 *Samples* mean representative physical examples of materials, equipment, or workmanship used to confirm compliance with requirements and/or to establish standards for use in execution of the Work.

1.38 *Schedule of Values* means the detailed breakdown of the cost of the materials, labor, and equipment necessary to accomplish the Work as described in the Contract Documents, submitted by Contractor for approval by Owner and A/E.

1.39 *Shop Drawings* mean the drawings, diagrams, illustrations, schedules, performance charts, brochures, and other data prepared by Contractor or its agents which detail a portion of the Work.

1.40 *Site* means the geographical area of the location of the Work.

1.41 *Special Conditions* mean the documents containing terms and conditions which may be unique to the Project. Special Conditions are a part of the Contract Documents and have precedence over the Uniform General Conditions and Supplementary General Conditions.

1.42 *Specifications* mean the written product of A/E that establishes the quality and/or performance of products utilized in the Work and processes to be used, including testing and verification for producing the Work.

1.43 *Subcontractor* means a business entity that enters into an agreement with Contractor to perform part of the Work or to provide services, materials, or equipment for use in the Work.

1.44 *Submittal Register* means a list provided by Contractor of all items to be furnished for review and approval by A/E and Owner and as identified in the Contract Documents including anticipated sequence and submittal dates.

1.45 *Substantial Completion* means the date determined and certified by Contractor, A/E, and Owner when the Work, or a designated portion thereof, is sufficiently complete, in accordance with the Contract, so as to be operational and fit for the use intended.

1.46 *Supplementary General Conditions* mean procedures and requirements that modify the Uniform General Conditions. Supplementary General Conditions, when used, have precedence over the Uniform General Conditions. ***Texas Parks and Wildlife Department has adopted Uniform Supplementary General Conditions that apply to all TPWD construction projects. TPWD Uniform Supplementary General Conditions are indicated by the bold and italicized typeface shown here.***

1.47 *Unit Price Work* means the Work, or a portion of the Work, paid for based on incremental units of measurement.

1.48 *Unilateral Change Order (ULCO)* means a Change Order issued by Owner without the complete agreement of Contractor, as to cost and/or time.

1.49 *Work* means the administration, procurement, materials, equipment, construction and all services necessary for Contractor, and/or its agents, to fulfill Contractor's obligations under the Contract.

1.50 *Work Progress Schedule* means the continually updated time schedule prepared and monitored by Contractor that accurately indicates all necessary appropriate revisions as required by the conditions of the Work and the Project while maintaining a concise comparison to the Baseline Schedule.

Article 2. Wage Rates and Other Laws Governing Construction

2.1 Environmental Regulations. Contractor shall conduct activities in compliance with applicable laws and regulations and other requirements of the Contract relating to the environment and its protection at all times. Unless otherwise specifically determined, Owner is responsible for obtaining and maintaining permits related to stormwater run-off. Contractor shall conduct operations consistent with stormwater run-off permit conditions. Contractor is responsible for all items it brings to the Site, including hazardous materials, and all such items brought to the Site by its Subcontractors and suppliers, or by other entities subject to direction of Contractor. Contractor shall not incorporate hazardous materials into the Work without prior approval of Owner, and shall provide an affidavit attesting to such in association with request for Substantial Completion inspection.

2.2 Wage Rates. Contractor shall not pay less than the wage scale of the various classes of labor as shown on the prevailing wage schedule provided by Owner in the bid or proposal specifications. The specified wage rates are minimum rates only. Owner is not bound to pay any claims for additional compensation made by any Contractor because the Contractor pays wages in excess of the applicable minimum rate contained in the Contract. The prevailing wage schedule is not a representation that qualified labor adequate to perform the Work is available locally at the prevailing wage rates.

2.2.1 Notification to Workers. Contractor shall post the prevailing wage schedule in a place conspicuous to all workers on the Project Site When requested by Owner, Contractor shall furnish evidence of compliance with the Texas Prevailing Wage Law and the addresses of all workers.

2.2.1.1 Pursuant to Tex. Gov't Code § 2258.024, Contractor shall keep, on site, true and accurate records showing the name and occupation of each worker employed by the Contractor or subcontractors and the actual per diem wages paid to each worker. The record shall be open to inspection by the ODR and their agents at all reasonable hours for the duration of the contract.

2.2.1.2 With each application for progress payment, Contractor shall make available upon request certified payroll records, including from subcontractors of any tier level, on Form WH-347 as promulgated by the U.S. Department of Labor, as may be revised from time to time and in unlocked and unprotected Excel format, along with copies of any and all Contract Documents between Contractor and any Subcontractors. Pursuant to Tex. Penal Code §§ 37.02 and 37.10, Employees of Contractor and subcontractors, including all tier levels, shall be subject to prosecution for submitting certified payroll records that contain materially false information.

2.2.1.3 The prevailing wage schedule is determined by Owner in compliance

with Tex. Gov't Code, Ch. 2258. Should Contractor at any time become aware that a particular skill or trade not reflected on Owner's prevailing wage schedule will be or is being employed in the Work, whether by Contractor or by Subcontractor, Contractor shall promptly inform ODR of the proposed wage to be paid for the skill along with a justification for same and ODR shall promptly concur with or reject the proposed wage and classification.

2.2.1.4 Contractor is responsible for determining the most appropriate wage for a particular skill in relation to similar skills or trades identified on the prevailing wage schedule. In no case, shall any worker be paid less than the wage indicated for laborers.

2.2.1.5 Pursuant to Tex. Labor Code § 214.008, Misclassification of Workers; Penalty. The Owner requires Contractor and all subcontractors properly classify individuals as Employees or Independent Contractors.

2.2.2 Penalty for Violation. Contractor, and any Subcontractor, will pay to the State a penalty of sixty dollars ($60) for each worker employed for each day, or portion thereof, that the worker is paid less than the wage rates stipulated in the prevailing wage schedule

2.2.3 Complaints of Violations.

2.2.3.1 Owner's Determination of Good Cause. Upon receipt of information concerning a violation, Owner will conduct an investigation in accordance with Tex. Gov't Code, Ch. 2258 and make an initial determination as to whether good cause exists that a violation occurred. Upon making a good cause finding, Owner will retain the full amounts claimed by the claimant or claimants as the difference between wages paid and wages due under the prevailing wage schedule and any supplements thereto, together with the applicable penalties in accordance with Tex. Gov't Code § 2258.023, such amounts being subtracted from successive progress payments pending a final decision on the violation.

2.2.3.2 No Extension of Time. If Owner's determination proves valid that good cause existed to believe a violation had occurred, Contractor is not entitled to an extension of time for any delay arising directly or indirectly from the arbitration procedures.

2.2.3.3 Cooperation with Owner's Investigation. Contractor shall cooperate with Owner during any investigations hereunder. Such cooperation shall include, but not necessarily be limited to, timely providing the information and/or documentation requested by Owner, which may include certified payroll records on Form WH-347 as promulgated by the U.S. Department of Labor, as may be revised from time to time and in unlocked and unprotected Excel format; and copies of any and

all Contract Documents between Contractor and any Subcontractors.

2.2.3.4 Notification to Owner. In the event Contractor or Subcontractor elect to appeal an initial determination made pursuant to Paragraph 2.2.3.1, the Contractor and/or Subcontractor, as applicable, shall deliver notice thereof to Owner.

2.3 Venue for Suits. The venue for any suit arising from the Contract will be in a court of competent jurisdiction in Travis County, Texas, or as may otherwise be designated in the Supplementary General Conditions.

2.4 Licensing of Trades. Contractor shall comply with all applicable provisions of State law related to license requirements for skilled tradesmen, contractors, suppliers and or laborers, as necessary to accomplish the Work. In the event Contractor, or one of its Subcontractors, loses its license during the term of performance of the Contract, Contractor shall promptly hire or contract with a licensed provider of the service at no additional cost to Owner.

2.5 Royalties, Patents, and Copyrights. Contractor shall pay all royalties and license fees, defend suits or claims for infringement of copyrights and patent rights, and shall hold Owner harmless from loss on account thereof, but shall not be responsible for such defense or loss when a particular design, process or product of a particular manufacturer or manufacturers is required by the Contract Documents, or where the copyright violations are contained in Drawings, Specifications or other documents prepared by Owner or A/E. However, if Contractor has reason to believe that the required design, process, or product is an infringement of a copyright or a patent, Contractor shall be responsible for such loss unless such information is promptly furnished to A/E.

2.6 State Sales and Use Taxes. Owner qualifies for exemption from certain State and local sales and use taxes pursuant to the provisions of Tex. Tax Code, Ch. 151. Upon request from Contractor, Owner shall furnish evidence of tax exempt status. Contractor may claim exemption from payment of certain applicable State taxes by complying with such procedures as prescribed by the State Comptroller of Public Accounts. Owner acknowledges not all items qualify for exemption. Owner is not obligated to reimburse Contractor for taxes paid on items that qualify for tax exemption.

Article 3. General Responsibilities of Owner and Contractor

3.1 Owner's General Responsibilities. Owner is the entity identified as such in the Contract and referred to throughout the Contract Documents as if singular in number.

3.1.1 Preconstruction Conference. Prior to, or concurrent with, the issuance of Notice to Proceed with construction, a conference will be convened for attendance by Owner, Contractor, A/E and appropriate Subcontractors. The purpose of the conference is to establish a working understanding among the parties as to the Work, the operational conditions at the Project Site, and general administration of the Project. Topics include communications, schedules, procedures for handling Shop Drawings and other submittals, processing Applications for Payment, maintaining required records and all other matters of importance to the administration of the Project and effective communications between the Project team members.

3.1.2 Owner's Designated Representative. Prior to the start of construction, Owner will identify Owner's Designated Representative (ODR), who has the express authority to act and bind Owner to the extent and for the purposes described in the various Articles of the Contract, including responsibilities for general administration of the Contract.

3.1.2.1 Unless otherwise specifically defined elsewhere in the Contract Documents, ODR is the single point of contact between Owner and Contractor. Notice to ODR, unless otherwise noted, constitutes notice to Owner under the Contract.

3.1.2.2 All directives on behalf of Owner will be conveyed to Contractor and A/E by ODR in writing.

3.1.2.3 Owner will furnish or cause to be furnished, free of charge, the number of complete sets of the Drawings, Specifications, and addenda as provided in the Supplementary General Conditions or Special Conditions.

3.1.2.4 The ODR will establish the protocol for planning, scheduling and documenting progress meetings with provisions for absence of various project team members that have a key role in these duties.

3.1.3 Owner Supplied Materials and Information.

3.1.3.1 Owner will furnish to Contractor those surveys describing the physical characteristics, legal description, limitations of the Site, Site utility locations, and other information used in the preparation of the Contract Documents.

3.1.3.2 Owner will provide information, equipment, or services under

Owner's control to Contractor with reasonable promptness.

3.1.4 Availability of Lands. Owner will furnish, as indicated in the Contract, all required rights to use the lands upon which the Work occurs. This includes rights-of-way and easements for access and such other lands that are designated for use by Contractor. Contractor shall comply with all Owner identified encumbrances or restrictions specifically related to use of lands so furnished. Owner will obtain and pay for easements for permanent structures or permanent changes in existing facilities.

3.1.5 Limitation on Owner's Duties.

3.1.5.1 Owner will not supervise, direct, control or have authority over or be responsible for Contractor's means, methods, technologies, sequences or procedures of construction or the safety precautions and programs incident thereto. Owner is not responsible for any failure of Contractor to comply with laws and regulations applicable to the Work. Owner is not responsible for the failure of Contractor to perform or furnish the Work in accordance with the Contract Documents. Except as provided in Section 2.5, Owner is not responsible for the acts or omissions of Contractor, or any of its Subcontractors, suppliers or of any other person or organization performing or furnishing any of the Work on behalf of Contractor.

3.1.5.2 Owner will not take any action in contravention of a design decision made by A/E in preparation of the Contract Documents, when such actions are in conflict with statutes under which A/E is licensed for the protection of the public health and safety.

3.2 Role of Architect/Engineer. Unless specified otherwise in the Contract between Owner and Contractor, A/E shall provide general administration services for Owner during the construction phase of the project. Written correspondence, requests for information, and Shop Drawings/submittals shall be directed to A/E for action. A/E has the authority to act on behalf of Owner to the extent provided in the Contract Documents, unless otherwise modified by written instrument, which will be furnished to Contractor by ODR, upon request.

3.2.1 Site Visits.

3.2.1.1 A/E will make visits to the Site at intervals as provided in the A/E's Contract with Owner, to observe the progress and the quality of the various aspects of Contractor's executed Work and report findings to Owner.

3.2.1.2 A/E has the authority to interpret Contract Documents and inspect the Work for compliance and conformance with the Contract. Except as referenced in Paragraph 3.1.5.2, Owner retains the sole authority to accept or reject Work and issue direction for correction,

removal, or replacement of Work.

3.2.2 Clarifications and Interpretations. It may be determined that clarifications or interpretations of the Contract Documents are necessary. Upon direction by ODR, such clarifications or interpretations will be provided by A/E consistent with the intent of the Contract Documents. A/E will issue these clarifications with reasonable promptness to Contractor as A/E's supplemental instruction ("ASI") or similar instrument. If Contractor believes that such clarification or interpretation justifies an adjustment in the Contract Sum or the Contract Time, Contractor shall so notify Owner in accordance with the provisions of Article 11.

3.2.3 Limitations on Architect/Engineer Authority. A/E is not responsible for:

3.2.3.1 Contractor's means, methods, techniques, sequences, procedures, safety, or programs incident to the Project, nor will A/E supervise, direct, control or have authority over the same;

3.2.3.2 The failure of Contractor to comply with laws and regulations applicable to the furnishing or performing the Work;

3.2.3.3 Contractor's failure to perform or furnish the Work in accordance with the Contract Documents; or

3.2.3.4 Acts or omissions of Contractor, or of any other person or organization performing or furnishing any of the Work.

3.3 Contractor's General Responsibilities. Contractor is solely responsible for implementing the Work in full compliance with all applicable laws and the Contract Documents and shall supervise and direct the Work using the best skill and attention to assure that each element of the Work conforms to the Contract requirements. Contractor is solely responsible for all construction means, methods, techniques, safety, sequences, coordination, procedures and protection of the installed work as part of the contract until substantial completion of the project. Contractor remains responsible for the care and protection of materials and Work in the areas where punch list items are completed until Final Completion.

3.3.1 Project Administration. Contractor shall provide Project administration for all Subcontractors, vendors, suppliers, and others involved in implementing the Work and shall coordinate administration efforts with those of A/E and ODR in accordance with these general conditions and other provisions of the Contract, and as outlined in the preconstruction conference. Contractor's Project Administration includes periodic daily reporting on weather, work progress, labor, materials, equipment, obstructions to prosecution of the work, accidents and injuries in accordance with the Contract and transmitted no less frequently than on a weekly basis.

3.3.2 Contractor's Management Personnel. Contractor shall employ a competent person or persons who will be present at the Project Site during the progress

of the Work to supervise or oversee the work. The competent persons are subject to the approval of ODR ***through the submittal process stated in Owner's Special Conditions***. Contractor shall not change approved staff during the course of the project without the written approval of ODR unless the staff member leaves the employment of Contractor. Contractor shall provide additional quality control, safety and other staff as stated in the Supplementary General Conditions.

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

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

3.3.5 Contractor General Responsibility. For Owner furnished equipment or material that will be in the care, custody, and control of Contractor, Contractor is responsible for damage or loss. Owner shall deliver to Contractor a complete list and respective values of such materials or equipment and make an equitable adjustment to the contract amount for any increase in cost of Builder's Risk insurance.

3.3.6 Non-Compliant Work. Should A/E and/or ODR identify Work as non-compliant with the Contract Documents, A/E and/or ODR shall communicate the finding to Contractor, and Contractor shall correct such Work at no additional cost to the Owner. The approval of Work by either A/E or ODR does not relieve Contractor from the obligation to comply with all requirements of the Contract Documents.

3.3.7 Subcontractors. Contractor shall not employ any Subcontractor, supplier or other person or organization, whether initially or as a substitute, against whom Owner shall have reasonable objection. Owner will communicate such objections in writing within ten (10) days of receipt of Contractor's intent to use such Subcontractor, supplier, or other person or organization. Contractor is not required to employ any Subcontractor, supplier or other person or organization to furnish any of the work to whom Contractor has reasonable objection. Contractor shall not substitute Subcontractors without the acceptance of Owner. Pursuant to Tex. Gov't Code § 2269.256(b), if the Contractor reviews, evaluates and recommends that the Owner accept a bid or proposal from a Subcontractor but the Owner requires another bid or proposal to be accepted, Owner shall compensate the Contractor by a change in price, time or guaranteed maximum cost for any additional cost or risk the Contractor will incur because of Owner's requirement to select another bid or proposal rather than the one recommended.

3.3.7.1 All Subcontracts and supply contracts shall be consistent with and bind the Subcontractors and suppliers to the terms and conditions of the Contract Documents including provisions of the Contract between Contractor and Owner.

3.3.7.2 Contractor shall be solely responsible for scheduling and coordinating the Work of Subcontractors, suppliers and other persons and organizations performing or furnishing any of the Work under a direct or indirect contract with Contractor. Require all Subcontractors, suppliers and such other persons and organizations performing or furnishing any of the Work to communicate with Owner only through Contractor. Contractor shall furnish to Owner a copy, at Owner's request, of each first-tier subcontract promptly after its execution. Contractor agrees that Owner has no obligation to review or approve the content of such contracts and that providing Owner such copies in no way relieves Contractor of any of the terms and conditions of the Contract, including, without limitation, any provisions of the Contract which require the Subcontractor to be bound to Contractor in the same manner in which Contractor is bound to Owner.

3.3.8 Continuing the Work. Contractor shall carry on the Work and adhere to the progress schedule during all disputes, disagreements, or alternative resolution processes with Owner. Contractor shall not delay or postpone any Work because of pending unresolved disputes, disagreements or alternative resolution processes, except as Owner and Contractor may agree in writing.

3.3.9 Cleaning. Contractor shall at all times, keep the Site and the Work clean and free from accumulation of waste materials or rubbish caused by the construction activities under the Contract. Contractor shall ensure that the entire Project is thoroughly cleaned prior to requesting Substantial Completion inspection and, again, upon completion of the Project prior to the final inspection.

3.3.10 Acts and Omissions of Contractor, its Subcontractors, and Employees. Contractor shall be responsible for acts and omissions of his employees and all its Subcontractors, their agents and employees. Owner may, in writing, require Contractor to remove from the Project any of Contractor's or its Subcontractor's employees whom ODR finds to be careless, incompetent, unsafe, uncooperative, disruptive, or otherwise objectionable.

3.3.11 Acts or Omissions. Contractor shall indemnify and hold harmless the State of Texas and Customers, AND/OR THEIR OFFICERS, AGENTS, EMPLOYEES, REPRESENTATIVES, CONTRACTORS, ASSIGNEES, AND/OR DESIGNEES FROM ANY AND ALL LIABILITY, ACTIONS, CLAIMS, DEMANDS, OR SUITS, AND ALL RELATED COSTS, ATTORNEY FEES, AND EXPENSES arising out of, or resulting from any acts or omissions of Contractor or its agents, employees, subcontractors, Order

Fulfillers, or suppliers of subcontractors in the execution or performance of the Contract and any Purchase Orders issued under the Contract. THE DEFENSE SHALL BE COORDINATED BY CONTRACTOR WITH THE OFFICE OF THE ATTORNEY GENERAL WHEN TEXAS STATE AGENCIES ARE NAMED DEFENDANTS IN ANY LAWSUIT AND CONTRACTOR MAY NOT AGREE TO ANY SETTLEMENT WITHOUT FIRST OBTAINING THE CONCURRENCE FROM THE OFFICE OF THE ATTORNEY GENERAL. CONTRACTOR AND OWNER AGREE TO FURNISH TIMELY WRITTEN NOTICE TO EACH OTHER OF ANY SUCH CLAIM.

3.3.12 Infringements.

3.3.12.1 Contractor shall indemnify and hold harmless the State of Texas and Customers, AND/OR THEIR EMPLOYEES, AGENTS, REPRESENTATIVES, CONTRACTORS, ASSIGNEES, AND/OR DESIGNEES from any and all third party claims involving infringement of United States patents, copyrights, trade and service marks, and any other intellectual or intangible property rights in connection with the PERFORMANCES OR ACTIONS OF CONTRACTOR PURSUANT TO THIS CONTRACT. CONTRACTOR AND THE CUSTOMER AGREE TO FURNISH TIMELY WRITTEN NOTICE TO EACH OTHER OF ANY SUCH CLAIM. CONTRACTOR SHALL BE LIABLE TO PAY ALL COSTS OF DEFENSE INCLUDING ATTORNEYS' FEES. THE DEFENSE SHALL BE COORDINATED BY CONTRACTOR WITH THE OFFICE OF THE ATTORNEY GENERAL WHEN TEXAS STATE AGENCIES ARE NAMED DEFENDANTS IN ANY LAWSUIT AND CONTRACTOR MAY NOT AGREE TO ANY SETTLEMENT WITHOUT FIRST OBTAINING THE CONCURRENCE FROM THE OFFICE OF THE ATTORNEY GENERAL.

3.3.12.2 Contractor shall have no liability under this section if the alleged infringement is caused in whole or in part by: (i) use of the product or service for a purpose or in a manner for which the product or service was not designed, (ii) any modification made to the product without Contractor's written approval, (iii) any modifications made to the product by Contractor pursuant to Customer's specific instructions, (iv) any intellectual property right owned by or licensed to Customer, or (v) any use of the product or service by Customer that is not in conformity with the terms of any applicable license agreement.

3.3.12.3 If Contractor becomes aware of an actual or potential claim, or Customer provides Contractor with notice of an actual or potential claim, Contractor may (or in the case of an injunction against Customer, shall), at Contractor's sole option and expense; (i) procure for the Customer the right to continue to use the affected portion of the product or service, or (ii) modify or replace the affected portion of the product or service with functionally equivalent or superior product

or service so that Customer's use is non-infringing.

3.3.12.4 Taxes/Workers' Compensation/Unemployment Insurance–Including Indemnity.

3.3.12.4.1 CONTRACTOR AGREES AND ACKNOWLEDGES THAT DURING THE EXISTENCE OF THIS CONTRACT, CONTRACTOR SHALL BE ENTIRELY RESPONSIBLE FOR THE LIABILITY AND PAYMENT OF CONTRACTOR'S AND CONTRACTOR'S EMPLOYEES' TAXES OF WHATEVER KIND, ARISING OUT OF THE PERFORMANCES IN THIS CONTRACT. CONTRACTOR AGREES TO COMPLY WITH ALL STATE AND FEDERAL LAWS APPLICABLE TO ANY SUCH PERSONS, INCLUDING LAWS REGARDING WAGES, TAXES, INSURANCE, AND WORKERS' COMPENSATION. THE CUSTOMER AND/OR THE STATE SHALL NOT BE LIABLE TO CONTRACTOR, ITS EMPLOYEES, AGENTS, OR OTHERS FOR THE PAYMENT OF TAXES OR THE PROVISION OF UNEMPLOYMENT INSURANCE AND/OR WORKERS' COMPENSATION OR ANY BENEFIT AVAILABLE TO A STATE EMPLOYEE OR EMPLOYEE OF ANOTHER GOVERNMENTAL ENTITY CUSTOMER.

3.3.12.4.1 CONTRACTOR AGREES TO INDEMNIFY AND HOLD HARMLESS OWNER, THE STATE OF TEXAS AND/OR THEIR EMPLOYEES, AGENTS, REPRESENTATIVES, CONTRACTORS, AND/OR ASSIGNEES FROM ANY AND ALL LIABILITY, ACTIONS, CLAIMS, DEMANDS, OR SUITS, AND ALL RELATED COSTS, ATTORNEYS' FEES, AND EXPENSES, RELATING TO TAX LIABILITY, UNEMPLOYMENT INSURANCE AND/OR WORKERS' COMPENSATION IN ITS PERFORMANCE UNDER THIS CONTRACT. CONTRACTOR SHALL BE LIABLE TO PAY ALL COSTS OF DEFENSE INCLUDING ATTORNEYS' FEES. THE DEFENSE SHALL BE COORDINATED BY CONTRACTOR WITH THE OFFICE OF THE ATTORNEY GENERAL WHEN TEXAS STATE AGENCIES ARE NAMED DEFENDANTS IN ANY LAWSUIT

AND VENDOR MAY NOT AGREE TO ANY SETTLEMENT WITHOUT FIRST OBTAINING THE CONCURRENCE FROM THE OFFICE OF THE ATTORNEY GENERAL. CONTRACTOR AND OWNER AGREE TO FURNISH TIMELY WRITTEN NOTICE TO EACH OTHER OF ANY SUCH CLAIM.

3.3.12.5 The provisions of this indemnification are solely for the benefit of the parties hereto and not intended to create or grant any rights, contractual or otherwise, to any other person or entity.

3.3.12.6 Contractor shall promptly advise Owner in writing of any claim or demand against Owner or against Contractor which involves Owner and known to Contractor and related to or arising out of Contractor's activities under this Contract.

3.3.13 Ancillary Areas. Operate and maintain operations and associated storage areas at the site of the Work in accordance with the following:

3.3.13.1 Confine all Contractor operations, including storage of materials and employee parking upon the Site of Work, to areas designated by Owner.

3.3.13.2 Contractor may erect, at its own expense, temporary buildings that will remain its property. Remove such buildings and associated utility service lines upon completion of the Work, unless Contractor requests and Owner provides written consent that it may abandon such buildings and utilities in place.

3.3.13.3 Use only established roadways or construct and use such temporary roadways as may be authorized by Owner. Do not allow load limits of vehicles to exceed the limits prescribed by appropriate regulations or law. Provide protection to road surfaces, curbs, sidewalks, trees, shrubbery, sprinkler systems, drainage structures and other like existing improvements to prevent damage and repair any damage thereto at the expense of Contractor.

3.3.13.4 Owner may restrict Contractor's entry to the Site to specifically assigned entrances and routes.

3.3.14 Separate Contracts. Owner reserves the right to award other contracts in connection with other portions of the Project under these same or substantially similar contract conditions, including those portions related to insurance and waiver of subrogation. Owner reserves the right to perform operations related to the Project with Owner's own forces.

3.3.15 Under a system of separate contracts, the conditions described herein continue to apply except as may be amended by change order.

3.3.16 Contractor shall cooperate with other contractors or forces employed on the Project by Owner, including providing access to Site and Project information as requested.

3.3.17 Owner shall be reimbursed by Contractor for costs incurred by Owner which are payable to a separate contractor because of delays, improperly timed activities, or defective construction by Contractor. Owner will equitably adjust the Contract by Change Order for costs incurred by Contractor because of delays, improperly timed activities, damage to the Work or defective construction by a separate contractor.

Article 4. Historically Underutilized Business (HUB) Subcontracting Plan

4.1 General Description. The purpose of the Historically Underutilized Business (HUB) program is to promote equal business opportunities for economically disadvantaged persons (as defined by Tex. Gov't Code, Ch. 2161) to contract with the State of Texas in accordance with the goals specified in the State of Texas Disparity Study. The HUB program annual procurement utilization goals are defined in 34 T.A.C. § 20.13(b).

4.1.1 State agencies are required by statute to make a good faith effort to assist HUBs in participating in contract awards issued by the State. 34 T.A.C. § 20.13(b) outlines the State's policy to encourage the utilization of HUBs in State contracting opportunities through race, ethnic and gender neutral means.

4.1.2 A Contractor who contracts with the State in an amount of $100,000 or greater is required to make a good faith effort to award subcontracts to HUBs in accordance with 34 T.A.C. § 20.14(a)(2)(A) by submitting a HUB subcontracting plan within twenty-four (24) hours after the bid or response is due and complying with the HUB subcontracting plan after it is accepted by Owner and during the term of the Contract. ***Unless stated otherwise in the contract documents, the HUB subcontracting plan shall be submitted with the bid or response on or before the specified due date and time for the bid or response.***

4.2 Compliance with Approved HUB Subcontracting Plan. Contractor, having been awarded this Contract in part by complying with the HUB program statute and rules, hereby covenants to continue to comply with the HUB program as follows:

4.2.1 Prior to adding or substituting a Subcontractor, promptly notify Owner in the event a change is required for any reason to the accepted HUB subcontracting plan.

4.2.2 Conduct the good-faith effort activities required and provide Owner with necessary documentation to justify approval of a change to the approved HUB subcontracting plan.

4.2.3 Cooperate in the execution of a Change Order or such other approval of the change in the HUB subcontracting plans as Contractor and Owner may agree to.

4.2.4 Maintain and make available to Owner upon request business records documenting compliance with the accepted HUB subcontracting plan.

4.2.5 Upon receipt of payment for performance of Work, submit to Owner a compliance report, in the format required by Owner that demonstrates Contractor's performance of the HUB subcontracting plan. ***TPWD requires submission of a copy of the compliance report with the Application for Payment for work performed.***

4.2.5.1 Progress Assessment Report (PAR): monthly compliance reports to Owner (contracting agency), verifying their compliance with the HUB subcontracting plan, including the use/expenditures they have made to Subcontractors. The PAR is available at in the Index Forms Library on the Facilities Design & Construction page of the Texas Facilities Commission website. (**http://www.window.state.tx.us/procurement/prog/hub/hub-forms/progressassessmentrpt.xls**). ***Contractor shall submit a PAR to TPWD HUB Administration no later than the 5th day of the month. Contractor shall submit a copy of the current month's PAR with the Application for Payment.***

4.2.6 Promptly and accurately explain and provide supplemental information to Owner to assist in Owner's investigation of Contractor's good-faith effort to fulfill the HUB subcontracting plan and the requirements under 34 T.A.C. § 20.14(a)(1).

4.3 Failure to Demonstrate Good-Faith Effort. Upon a determination by Owner that Contractor has failed to demonstrate a good-faith effort to fulfill the HUB subcontracting plan or any Contract covenant detailed above, Owner may, in addition to all other remedies available to it, report the failure to perform to the Comptroller of Public Accounts, Texas Procurement and Support Services Division, Historically Underutilized Business Program and may bar Contractor from future contracting opportunities with Owner.

Article 5. Bonds and Insurance

5.1 Construction Bonds. Contractor is required to tender to Owner, prior to commencing the Work, performance and payment bonds, as required by Tex. Gov't Code, Ch. 2253. On Construction Manager-at-Risk and Design-Build Projects the Owner shall require a security bond, as described in Subsection 5.1.2 below.

5.1.1 Bond Requirements. Each bond shall be executed by a corporate surety or sureties authorized to do business in the State of Texas and acceptable to Owner, on Owner's form, and in compliance with the relevant provisions of the Texas Insurance Code. If any bond is for more than ten (10) percent of the surety's capital and surplus, Owner may require certification that the company has reinsured the excess portion with one or more reinsurers authorized to do business in the State. A reinsurer may not reinsure for more than ten (10) percent of its capital and surplus. If a surety upon a bond loses its authority to do business in the State, Contractor shall, within thirty (30) days after such loss, furnish a replacement bond at no added cost to Owner.

5.1.1.1 A Performance bond is required if the Contract Sum is in excess of $100,000. The performance bond is solely for the protection of Owner. The performance bond is to be for the Contract Sum to guarantee the faithful performance of the Work in accordance with the Contract Documents. The form of the bond shall be approved by the Office of the Attorney General of Texas. The performance bond shall be effective through Contractor's warranty period.

5.1.1.2 A Payment bond is required if the Contract price is in excess of $25,000. The payment bond is to be for the Contract Sum and is payable to Owner solely for the protection and use of payment bond beneficiaries. The form of the bond shall be approved by the Office of the Attorney General of Texas.

5.1.2 Security Bond. The security bond provides protection to Owner if Contractor presents an acceptable guaranteed maximum price ("GMP") to Owner and 1) fails to execute the GMP; or 2) fails to deliver the required payment and performance bonds within the time period stated below.

5.1.3 When Bonds Are Due.

5.1.3.1 Security bonds are due within ten (10) days of signing a Construction Manager-at-Risk or Design-Build Contract, ***unless stated otherwise in the contract documents***.

5.1.3.2 Payment and performance bonds are due within ten (10) days of Contractor's receipt of a fully executed GMP on a Construction Manager-at-Risk project or the Contract Sum for a Design-Build project, or within ten (10) days of Contractor's receipt of a fully executed Contract on competitively bid or competitive sealed

proposal projects.

5.1.4 Power of Attorney. Each bond shall be accompanied by a valid power of attorney (issued by the surety company and attached, signed and sealed with the corporate embossed seal, to the bond) authorizing the attorney-in-fact who signs the bond to commit the company to the terms of the bond, and stating any limit in the amount for which the attorney can issue a single bond.

5.1.5 Bond Indemnification. The process of requiring and accepting bonds and making claims there under shall be conducted in compliance with Tex. Gov't Code, Ch. 2253. IF FOR ANY REASON A STATUTORY PAYMENT OR PERFORMANCE BOND IS NOT HONORED BY THE SURETY, CONTRACTOR SHALL FULLY INDEMNIFY AND HOLD OWNER HARMLESS OF AND FROM ANY COSTS, LOSSES, OBLIGATIONS OR LIABILITIES IT INCURS AS A RESULT.

5.1.6 Furnishing Bond Information. Owner shall furnish certified copies of the payment bond and the related Contract to any qualified person seeking copies who complies with Tex. Gov't Code § 2253.026.

5.1.7 Claims on Payment Bonds. Claims on payment bonds must be sent directly to Contractor and his surety in accordance with Tex. Gov't Code § 2253.041. All payment bond claimants are cautioned that no lien exists on the funds unpaid to Contractor on such Contract, and that reliance on notices sent to Owner may result in loss of their rights against Contractor and/or his surety. Owner is not responsible in any manner to a claimant for collection of unpaid bills, and accepts no such responsibility because of any representation by any agent or employee.

5.1.8 Payment Claims when Payment Bond not Required. The rights of Subcontractors regarding payment are governed by Tex. Prop. Code §§ 53.231 – 53.239 when the value of the Contract between Owner and Contractor is less than $25,000.00. These provisions set out the requirements for filing a valid lien on funds unpaid to Contractor as of the time of filing the claim, actions necessary to release the lien and satisfaction of such claim.

5.1.9 Sureties. A surety shall be listed on the US Department of the Treasury's Listing of Approved Sureties maintained by the Bureau of Financial Management Service (FMS), www.fms.treas.gov/c570, stating companies holding Certificates of Authority as acceptable sureties on Federal bonds and acceptable reinsuring companies (FMS Circular 570).

5.2 Insurance Requirements. Contractor shall carry insurance in the types and amounts indicated in this Article for the duration of the Contract. The insurance shall be evidenced by delivery to Owner of certificates of insurance executed by the insurer or its authorized agent stating coverages, limits, expiration dates and compliance with all applicable required provisions. Upon request, Owner, and/or its agents, shall be entitled to receive without expense, copies of the policies and all endorsements. Contractor shall update all expired policies prior to submission for monthly payment.

Failure to update policies shall be reason for withholding of payment until renewal is provided to Owner.

5.2.1 Contractor shall provide and maintain all insurance coverage with the minimum amounts described below until the end of the warranty period unless otherwise stated in Supplementary General Conditions or Special Conditions. Failure to maintain insurance coverage, as required, is grounds for suspension of Work for cause pursuant to Article 14.

5.2.2 Contractor shall deliver to Owner true and complete copies of certificates and corresponding policy endorsements prior to the issuance of any Notice to Proceed.

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

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

5.2.5 The insurance coverage and limits established herein shall not be interpreted as any representation or warranty that the insurance coverage and limits necessarily will be adequate to protect Contractor.

5.2.6 Coverage shall be written on an occurrence basis by companies authorized and admitted to do business in the State of Texas and rated A or better by A.M. Best Company or similar rating company or otherwise acceptable to Owner.

5.2.2.1 Insurance Coverage Required.

5.2.2.1.1 Workers' Compensation. Insurance with limits as required by the Texas Workers' Compensation Act, with the policy endorsed to provide a waiver of subrogation in favor of Owner, employer's liability insurance of not less than:

$1,000,000 each accident;

$1,000,000 disease each employee; and

$1,000,000 disease policy limit.

5.2.2.1.2 Commercial General Liability Insurance. Including premises, operations, independent contractor's liability, products and completed operations and contractual liability, covering, but not limited to, the liability assumed under the indemnification provisions of this Contract, fully insuring Contractor's liability for bodily injury

(including death) and property damage with a minimum limit of:

$1,000,000 per occurrence;

$2,000,000 general aggregate;

$5,000 Medical Expense each person;

$1,000,000 Personal Injury and Advertising Liability;

$2,000,000 products and completed operations aggregate;

$50,000 Damage to Premises Rented to You; and

Coverage shall be on an "occurrence" basis.

The policy shall include coverage extended to apply to completed operations and explosion, collapse, and underground hazards. The policy shall include endorsement CG2503 Amendment of Aggregate Limits of Insurance (per Project) or its equivalent.

If the Work involves any activities within fifty (50) feet of any railroad, railroad protective insurance as may be required by the affected railroad, written for not less than the limits required by such railroad.

5.2.2.1.3 Asbestos Abatement Liability Insurance, including coverage for liability arising from the encapsulation, removal, handling, storage, transportation, and disposal of asbestos containing materials. *This requirement applies if the Work or the Project includes asbestos containing materials.

The combined single limit for bodily injury and property damage will be a minimum of $1,000,000 per occurrence.

*Specific requirement for claims-made form: Required period of coverage will be determined by the following formula: continuous coverage for life of the Contract, plus one (1) year (to provide coverage for the warranty period), and an extended discovery period for a minimum of five (5) years which shall begin at the end of the warranty period.

Employer's liability limits for asbestos abatement will be:

$500,000 each accident;

$500,000 disease each employee; and

$500,000 disease policy limit.

If this Contract is for asbestos abatement only, the Special Form builder's risk or Special Form installation floater (e) is not required.

5.2.2.1.4 Comprehensive Automobile Liability Insurance, covering owned, hired, and non-owned vehicles, with a minimum combined single limit for bodily injury (including death) and property damage of $1,000,000 per accident. No aggregate shall be permitted for this type of coverage.

Such insurance is to include coverage for loading and unloading hazards.

5.2.2.1.5 Special Form Builder's Risk Insurance, if applicable (or Special Form installation floater for instances in which the project involves solely the installation of material and/or equipment). Coverage shall be Special Form, including, but not limited to, fire, extended coverage, vandalism and malicious mischief, theft and, if applicable, flood, earth movement and named storm. Builder's risk and installation floater limits shall be equal to 100 percent of the Contract Sum plus, if any, existing property and Owner-furnished equipment specified by Owner. The policy shall be written jointly in the names of Owner and Contractor. Subcontractors shall be named as additional insureds. The policy shall have endorsements as follows:

5.2.2.1.5.1 This insurance shall be specific as to coverage and not contributing insurance with any permanent insurance maintained on the property.

5.2.2.1.5.2 This insurance shall not contain an occupancy clause suspending or reducing coverage should Owner partially occupy the Site and before the parties have determined Substantial Completion.

5.2.2.1.5.3 Loss, if any, shall be adjusted with and made payable to Owner as trustee for the insureds as their interests may appear. Owner shall be named as loss payee.

5.2.2.1.5.4 For renovation projects or projects that involve portions of Work contained within an existing structure, refer to Supplementary General and Special Conditions for possible additional builder's risk insurance requirements.

5.2.2.1.5.5 For Owner furnished equipment or materials that will be in care, custody or control of Contractor, Contractor will be responsible for damage and loss.

5.2.2.1.5.6 For those properties located within a Tier 1 or 2 windstorm area, named storm coverage must be provided with limits specified by Owner.

5.2.2.1.5.7 For those properties located in flood prone areas, flood insurance coverage must be provided with limits specified by Owner.

5.2.2.1.5.8 Builder's risk insurance policy shall remain in effect until Substantial Completion.

5.2.2.1.6 "Umbrella" Liability Insurance. Contractor shall obtain, pay for and maintain umbrella liability insurance during the Contract term, insuring Contractor for an amount of not less than amount specified in the Supplementary General Conditions or Special Conditions that provides coverage at least as broad as and applies in excess and follows form of the primary liability coverages required hereinabove. The policy shall provide "drop down" coverage where underlying primary insurance coverage limits are insufficient or exhausted.

5.2.3 Policies must include the following clauses, as applicable:

5.2.3.1 This insurance shall not be canceled, materially changed, or non-renewed except after thirty (30) days written notice has been given to Owner.

5.2.3.2 It is agreed that Contractor's insurance shall be deemed primary with respect to any insurance or self insurance carried by Owner for liability arising out of operations under the Contract with Owner.

5.2.3.3 Owner, its officials, directors, employees, representatives, and volunteers are added as additional insureds as respects operations and activities of, or on behalf of the named insured performed under Contract with Owner. The additional insured status must cover

completed operations as well. This is not applicable to workers' compensation policies.

5.2.3.4 A waiver of subrogation in favor of Owner shall be provided in all policies.

5.2.4 Without limiting any of the other obligations or liabilities of Contractor, Contractor shall require each Subcontractor performing work under the Contract, at Subcontractor's own expense, to maintain during the term of the Contract, the same stipulated minimum insurance including the required provisions and additional policy conditions as shown above. As an alternative, Contractor may include its Subcontractors as additional insureds on its own coverage as prescribed under these requirements. Contractor's certificate of insurance shall note in such event that Subcontractors are included as additional insureds and that Contractor agrees to provide workers' compensation for Subcontractors and their employees. Contractor shall obtain and monitor the certificates of insurance from each Subcontractor in order to assure compliance with the insurance requirements. Contractor must retain the certificates of insurance for the duration of the Contract plus five (5) years and shall have the responsibility of enforcing these insurance requirements among its Subcontractors. Owner shall be entitled, upon request and without expense, to receive copies of these certificates.

5.2.5 Workers' compensation insurance coverage must be provided for all workers at al tier levels and meet the statutory requirements of Tex. Lab. Code § 401.011(44) and specific to construction projects for public entities as required by Tex. Lab. Code § 406.096.

Article 6. Construction Documents, Coordination Documents, and Record Documents

6.1 Drawings and Specifications.

6.1.1 Copies Furnished. Contractor will be furnished, free of charge, the number of complete sets of the Drawings, Specifications, and Addenda as provided in the Supplementary General Conditions or Special Conditions. Additional complete sets of Drawings and Specifications, if requested, will be furnished at reproduction cost to the entity requesting such additional sets. Electronic copies of such documents will be provided to Contractor without charge. ***Unless otherwise called for in the Special Conditions, four (4) sets of drawings and specifications will be furnished to the Contractor free of charge upon justification of need***.

6.1.2 Ownership of Drawings and Specifications. All Drawings, Specifications and copies thereof furnished by A/E are to remain A/E's property ***unless the Owner and A/E agree otherwise.*** These documents are not to be used on any other project, and with the exception of the Contract record set and electronic versions needed for warranty operations, are to be returned to the A/E, upon request, following completion of the Work.

6.1.3 Interrelation of Documents. The Contract Documents as referenced in the Contract between Owner and Contractor are complimentary, and what is required by one shall be as binding as if required by all.

6.1.4 Resolution of Conflicts in Documents. Where conflicts may exist within the Contract Documents, the documents shall govern in the following order: (a) Change Orders, addenda, and written amendments to the Contract; (b) the Contract; (c) Drawings; (d) Specifications (but Specifications shall control over Drawings as to quality of materials and workmanship); and (e) other Contract Documents. Among categories of documents having the same order of precedence, the term or provision that includes the latest date shall control and more specific requirements shall govern over general requirements. Contractor shall notify A/E and ODR for resolution of the issue prior to executing the Work in question.

6.1.5 Contractor's Duty to Review Contract Documents. In order to facilitate its responsibilities for completion of the Work in accordance with and as reasonably inferable from the Contract Documents, prior to commencing the Work, Contractor shall examine and compare the Contract Documents, information furnished by Owner, relevant field measurements made by Contractor and any visible or reasonably anticipated conditions at the Site affecting the Work. This duty extends throughout the construction phase prior to commencing each particular work activity and/or system installation.

6.1.6 Discrepancies and Omissions in Drawings and Specifications.

6.1.6.1 Promptly report to ODR and to A/E the discovery of any apparent error, omission or inconsistency in the Contract Documents prior to execution of the Work. ***The Owner does not warrant or make any representations as to the accuracy or completeness of the information furnished to the Contractor by the Owner***

6.1.6.2 It is recognized that Contractor is not acting in the capacity of a licensed design professional, unless it is performing as a Design-Build firm.

6.1.6.3 It is further recognized that Contractor's examination of Contract Documents is to facilitate construction and does not create an affirmative responsibility to detect errors, omissions or inconsistencies or to ascertain compliance with applicable laws, building codes or regulations, unless it is performing as a Design-Build firm or a Construction Manager-at-Risk.

6.1.6.4 When performing as a Design-Build firm, Contractor has sole responsibility for discrepancies, errors, and omissions in the Drawings and Specifications.

6.1.6.5 When performing as a Construction Manager-at-Risk, Contractor has a shared responsibility with A/E for discovery and resolution of discrepancies, errors, and omissions in the Contract Documents. In such case, Contractor's responsibility pertains to review, coordination, and recommendation of resolution strategies within budget constraints.

6.1.6.6 Contractor has no liability for errors, omissions, or inconsistencies unless Contractor knowingly failed to report a recognized problem to Owner or the Work is executed under a Design-Build or Construction Manager-at-Risk Contract as outlined above. Should Contractor fail to perform the examination and reporting obligations of these provisions, Contractor is responsible for avoidable costs and direct and/or consequential damages.

6.2 Requirements for Record Documents. Contractor shall:

6.2.1 Maintain at the Site one copy of all Drawings, Specifications, addenda, approved submittals, Contract modifications, and all Project correspondence. Keep current and maintain Drawings and Specifications in good order with postings and markings to record actual conditions of Work and show and reference all changes made during construction. Provide Owner and A/E access to these documents.

6.2.2 Maintain the ~~Record Documents~~ ***As-Builts*** including Drawings, Specifications and other materials which reflect the actual field conditions and representations of the Work performed, whether it be directed by addendum, Change Order or otherwise. Make available all records prescribed herein for reference and examination by Owner and its representatives and agents.

6.2.3 Update the ~~Record Documents~~ ***As-Builts*** at least monthly prior to submission of periodic partial pay estimates. Failure to maintain current Record Documents constitutes cause for denial of a progress payment otherwise due.

6.2.4 Prior to requesting Substantial Completion inspection Contractor shall furnish a copy of its marked-up ~~Record Documents~~ ***As-Builts*** and a preliminary copy of each instructional manual, maintenance and operating manual, parts catalog, wiring diagrams, spare parts, specified written warranties and like publications, or parts for all installed equipment, systems, and like items and as described in the Contract Documents. (Unexecuted samples of the aforementioned documentation may be reviewed by ODR when the absence of substantial completion transactions preclude execution; however, Contractor remains obligated to provide fully executed copies of such materials prior to final payment.)

6.2.5 Once determined acceptable by ODR with input from A/E, provide one (1) reproducible copy and one (1) electronic media copy of all ~~Record Documents~~ ***As-Built documents*** unless otherwise required by the Supplementary General Conditions or Special Conditions.

6.2.6 Contractor shall be responsible for updating the ~~Record~~ ***As-Built*** Documents for all Contractor initiated documents and changes to the Contract Documents due to coordination and actual field conditions, including RFIs.

6.2.7 A/E shall be responsible for updating the ~~Record~~ ***As-Built*** Documents ~~for~~ ***with*** any addenda, Change Orders, A/E supplemental instructions and any other alterations to the Contract Documents generated by A/E or Owner. ***A/E shall be responsible for compiling all As-Built documentation (as produced both by the Contractor and by the A/E) into the Record Documents.***

Article 7. Construction Safety

7.1 General. It is the duty and responsibility of Contractor and all of its Subcontractors to be familiar with, enforce and comply with all requirements of Public Law No. 91-596, 29 U.S.C. § 651 et. seq., the Occupational Safety and Health Act of 1970, (OSHA) and all amendments thereto. Contractor shall prepare a safety plan specific to the Project and submit it to ODR and A/E prior to commencing Work. In addition, Contractor and all of its Subcontractors shall comply with all applicable laws and regulations of any public body having jurisdiction for safety of persons or property to protect them from damage, injury or loss and erect and maintain all necessary safeguards for such safety and protection.

7.2 Notices. Contractor shall provide notices as follows:

7.2.1 Notify owners of adjacent property including those that own or operate utility services and/or underground facilities, and utility owners, when prosecution of the Work may affect them or their facilities, and cooperate with them in the protection, removal, relocation and replacement, and access to their facilities and/or utilities.

7.2.2 Coordinate the exchange of material safety data sheets (MSDSs) or other hazard communication information required to be made available to or exchanged between or among employers at the site in connection with laws and regulations. Maintain a complete file of MSDSs for all materials in use on site throughout the construction phase and make such file available to Owner and its agents as requested.

7.3 Emergencies. In any emergency affecting the safety of persons or property, Contractor shall act to minimize, mitigate, and prevent threatened damage, injury or loss.

7.3.1 Have authorized agents of Contractor respond immediately upon call at any time of day or night when circumstances warrant the presence of Contractor to protect the Work or adjacent property from damage or to take such action pertaining to the Work as may be necessary to provide for the safety of the public.

7.3.2 Give ODR and A/E prompt notice of all such events.

7.3.3 If Contractor believes that any changes in the Work or variations from Contract Documents have been caused by its emergency response, promptly notify Owner within seventy-two (72) hours of the emergency response event.

7.3.4 Should Contractor fail to respond, Owner is authorized to direct other forces to take action as necessary and Owner may deduct any cost of remedial action from funds otherwise due Contractor.

7.4 Injuries. In the event of an incident or accident involving outside medical care for an individual on or near the Work, Contractor shall notify ODR and other parties as may be directed promptly, but no later than twenty-four (24) hours after Contractor learns that an event required medical care.

7.4.1 Record the location of the event and the circumstances surrounding it, by using photography or other means, and gather witness statements and other documentation which describes the event.

7.4.2 Supply ODR and A/E with an incident report no later than thirty-six (36) hours after the occurrence of the event. In the event of a catastrophic incident (one (1) fatality or three (3) workers hospitalized), barricade and leave intact the scene of the incident until all investigations are complete. A full set of incident investigation documents, including facts, finding of cause, and remedial plans shall be provided within one (1) week after occurrence, unless otherwise directed by legal counsel. Contractor shall provide ODR with written notification within one week of such catastrophic event if legal counsel delays submission of full report.

7.5 Environmental Safety. Upon encountering any previously unknown potentially hazardous material, or other materials potentially contaminated by hazardous material, Contractor shall immediately stop work activities impacted by the discovery, secure the affected area, and notify ODR immediately.

7.5.1 Bind all Subcontractors to the same duty.

7.5.2 Upon receiving such notice, ODR will promptly engage qualified experts to make such investigations and conduct such tests as may be reasonably necessary to determine the existence or extent of any environmental hazard. Upon completion of this investigation, ODR will issue a written report to Contractor identifying the material(s) found and indicate any necessary steps to be taken to treat, handle, transport or dispose of the material.

7.5.3 Owner may hire third-party Contractors to perform any or all such steps.

7.5.4 Should compliance with ODR's instructions result in an increase in Contractor's cost of performance, or delay the Work, Owner will make an equitable adjustment to the Contract Sum and/or the time of completion, and modify the Contract in writing accordingly.

7.6 Trenching Plan. When the project requires excavation which either exceeds a depth of four (4) feet, or results in any worker's upper body being positioned below grade level, Contractor is required to submit a trenching plan to ODR prior to commencing trenching operations unless an engineered plan is part of the Contract Documents. The plan is required to be prepared and sealed by a professional engineer registered in the State of Texas, and hired or employed by Contractor or Subcontractor to perform the work. Said engineer cannot be anyone who is otherwise either directly or indirectly engaged on this project.

Article 8. Quality Control

8.1 Materials & Workmanship. Contractor shall execute Work in a good and workmanlike matter in accordance with the Contract Documents. Contractor shall develop and provide a quality control plan specific to this Project and acceptable to Owner. Where Contract Documents do not specify quality standards, complete and construct all Work in compliance with generally accepted construction industry standards. Unless otherwise specified, incorporate all new materials and equipment into the Work under the Contract.

8.2 Testing.

8.2.1 Owner is responsible for coordinating and paying for routine and special tests required to confirm compliance with quality and performance requirements, except as stated below or otherwise required by the Contract Documents. Contractor shall provide the following testing:

8.2.1.1 Any test of basic material or fabricated equipment included as part of a submittal for a required item in order to establish compliance with the Contract Documents.

8.2.1.2 Any test of basic material or fabricated equipment offered as a substitute for a specified item on which a test may be required in order to establish compliance with the Contract Documents.

8.2.1.3 Preliminary, start-up, pre-functional and operational testing of building equipment and systems as necessary to confirm operational compliance with requirements of the Contract Documents.

8.2.1.4 All subsequent tests on original or replaced materials conducted as a result of prior testing failure.

8.2.2 All testing shall be performed in accordance with standard test procedures by an accredited laboratory, or special consultant as appropriate, acceptable to Owner. Results of all tests shall be provided promptly to ODR, A/E, and Contractor.

8.2.3 Non-Compliance (Test Results). Should any of the tests indicate that a material and/or system does not comply with the Contract requirements, the burden of proof remains with Contractor, subject to:

8.2.3.1 Contractor selection and submission of the laboratory for Owner acceptance.

8.2.3.2 Acceptance by Owner of the quality and nature of tests.

8.2.3.3 All tests taken in the presence of A/E and/or ODR, or their representatives.

8.2.3.4 If tests confirm that the material/systems comply with Contract Documents, Owner will pay the cost of the test.

8.2.3.5 If tests reveal noncompliance, Contractor will pay those laboratory fees and costs of that particular test and all future tests, of that failing Work, necessary to eventually confirm compliance with Contract Documents.

8.2.3.6 Proof of noncompliance with the Contract Documents will make Contractor liable for any corrective action which ODR determines appropriate, including complete removal and replacement of non-compliant work or material.

8.2.4 Notice of Testing. Contractor shall give ODR and A/E timely notice of its readiness and the date arranged so ODR and A/E may observe such inspection, testing, or approval. ***Contractor shall give Owner a minimum of five (5) working days advance notice prior to testing.***

8.2.5 Test Samples. Contractor is responsible for providing Samples of sufficient size for test purposes and for coordinating such tests with their Work Progress Schedule to avoid delay.

8.2.6 Covering Up Work. If Contractor covers up any Work without providing Owner an opportunity to inspect, Contractor shall, if requested by ODR, uncover and recover the work at Contractor's expense.

8.3 Submittals.

8.3.1 Contractor's Submittals. Contractor shall submit with reasonable promptness consistent with the Project schedule and in orderly sequence all Shop Drawings, Samples, or other information required by the Contract Documents, or subsequently required by Change Order. Prior to submitting, Contractor shall review each submittal for general compliance with Contract Documents and approve submittals for review by A/E and Owner by an approval stamp affixed to each copy. Submittal data presented without Contractor's stamp will be returned without review or comment, and any delay resulting from failure is Contractor's responsibility.

8.3.1.1 Contractor shall within twenty-one (21) days of the effective date of the Notice To Proceed with construction, submit to ODR and A/E, a submittal schedule/register, organized by specification section, listing all items to be furnished for review and approval by A/E and Owner. The list shall include Shop Drawings, manufacturer's literature, certificates of compliance, materials Samples, materials colors, guarantees, and all other items identified throughout the Specifications.

8.3.1.2 Contractor shall indicate the type of item, Contract requirements reference, and Contractor's scheduled dates for submitting the item along with the requested dates for approval answers from A/E and

Owner. The submittal register shall indicate the projected dates for procurement of all included items and shall be updated at least monthly with actual approval and procurement dates. Contractor's Submittal Register must be reasonable in terms of the review time for complex submittals. Contractor's submittal schedule must be consistent with the Work Progress Schedule and identify critical submittals. Show and allow a minimum of fifteen (15) calendar days duration after receipt by A/E and ODR for review and approval. If resubmittal required, allow a minimum of an additional fifteen (15) calendar days for review. Submit the updated Submittal Register with each request for progress payment. Owner may establish routine review procedures and schedules for submittals at the preconstruction conference and/or elsewhere in the Contract Documents. If Contractor fails to update and provide the Submittal Register as required, Owner may, after seven (7) days notice to Contractor withhold a reasonable sum of money that would otherwise be due Contractor.

8.3.1.3 Contractor shall coordinate the Submittal Register with the Work Progress Schedule. Do not schedule Work requiring a submittal to begin prior to scheduling review and approval of the related submittal. Revise and/or update both schedules monthly to ensure consistency and current project data. Provide to ODR the updated Submittal Register and schedule with each application for progress payment. Refer to requirements for the Work Progress Schedule for inclusion of procurement activities therein. Regardless, the Submittal Register shall identify dates submitted and returned and shall be used to confirm status and disposition of particular items submitted, including approval or other action taken and other information not conveniently tracked through the Work Progress Schedule.

8.3.1.4 By submitting Shop Drawings, Samples or other required information, Contractor represents that it has determined and verified all applicable field measurements, field construction criteria, materials, catalog numbers and similar data to the extent possible from existing conditions and design information provided by A/E prior to fabrication; and has checked and coordinated each Shop Drawing and Sample with the requirements of the Work and the Contract Documents.

8.3.2 Review of Submittals. A/E and ODR review is only for conformance with the design concept and the information provided in the Contract Documents. Responses to submittals will be in writing. The approval of a separate item does not indicate approval of an assembly in which the item functions. The approval of a submittal does not relieve Contractor of responsibility for any deviation from the requirements of the Contract unless Contractor informs A/E and ODR of such deviation in a clear, conspicuous, and written manner on the submittal transmittal and at the time of submission, and obtains Owner's

written specific approval of the particular deviation.

8.3.3 Correction and Resubmission. Contractor shall make any corrections required to a submittal and resubmit the required number of corrected copies promptly so as to avoid delay, until submittal approval. Direct attention in writing to A/E and ODR, when applicable, to any new revisions other than the corrections requested on previous submissions.

8.3.4 Limits on Shop Drawing Review. Contractor shall not commence any Work requiring a submittal until review of the submittal ***is fully executed*** under Subsection 8.3.2. Construct all such work in accordance with reviewed submittals. Comments incorporated as part of the review in Subsection 8.3.2 of Shop Drawings and Samples is not authorization to Contractor to perform extra work or changed work unless authorized through a Change Order. A/E's and ODR's review, if any, does not relieve Contractor from responsibility for defects in the Work resulting from errors or omissions of any kind on the submittal, regardless of any approval action. A/E or ODR shall not make formal changes to the Contract Documents via the submittal process. Changes to the Construction Documents shall be accomplished via Section 3.2.2 and Article 11 Changes.

8.3.5 No Substitutions Without Approval. ODR and A/E may receive and consider Contractor's request for substitution when Contractor agrees to reimburse Owner for review costs and satisfies the requirements of this section. If Contractor does not satisfy these conditions, ODR and A/E will return the request without action except to record noncompliance with these requirements. Owner will not consider the request if Contractor cannot provide the product or method because of failure to pursue the Work promptly or coordinate activities properly. Contractor's request for a substitution may be considered by ODR and A/E when:

8.3.5.1 The Contract Documents do not require extensive revisions; and

8.3.5.2 Proposed changes are in keeping with the general intent of the Contract Documents and the design intent of A/E and do not result in an increase in cost to Owner; and

8.3.5.3 The request is timely, fully documented, properly submitted and one or more of the following apply:

8.3.5.3.1 Contractor cannot provide the specified product, assembly or method of construction within the Contract Time;

8.3.5.3.2 The request directly relates to an "or-equal" clause or similar language in the Contract Documents;

8.3.5.3.3 The request directly relates to a "product design standard" or "performance standard" clause in the Contract

Documents;

8.3.5.3.4 The requested substitution offers Owner a substantial advantage in cost, time, energy conservation or other considerations, after deducting additional responsibilities Owner must assume;

8.3.5.3.5 The specified product or method of construction cannot receive necessary approval by an authority having jurisdiction, and ODR can approve the requested substitution;

8.3.5.3.6 Contractor cannot provide the specified product, assembly or method of construction in a manner that is compatible with other materials and where Contractor certifies that the substitution will overcome the incompatibility;

8.3.5.3.7 Contractor cannot coordinate the specified product, assembly or method of construction with other materials and where Contractor certifies they can coordinate the proposed substitution; or

8.3.5.3.8 The specified product, assembly or method of construction cannot provide a warranty required by the Contract Documents and where Contractor certifies that the proposed substitution provides the required warranty.

8.3.5.3.9 The manufacturer of the specified product has been removed from production due to cancellation or obsolescence.

8.3.6 Unauthorized Substitutions at Contractor's Risk. Contractor is financially responsible for any additional costs or delays resulting from unauthorized substitution of materials, equipment or fixtures other than those specified. Contractor shall reimburse Owner for any increased design or contract administration costs resulting from such unauthorized substitutions.

8.4 Field Mock-up.

8.4.1 Mock-ups shall be constructed prior to commencement of a specified scope of work to confirm acceptable workmanship.

8.4.1.1 As a minimum, field mock-ups shall be constructed for roofing systems, exterior veneer / finish systems, glazing systems, and any other Work requiring a mock-up as identified throughout the Contract Documents. Mock-ups for systems not part of the Project scope shall not be required.

8.4.1.2 Mock-ups may be incorporated into the Work if allowed by the

Contract Documents and if acceptable to ODR. If mock-ups are freestanding, they shall remain in place until otherwise directed by Owner.

8.4.1.3 Contractor shall include field mock-ups in their Work Progress Schedule and shall notify ODR and A/E of readiness for review sufficiently in advance to coordinate review without delay.

8.5 Inspection During Construction.

8.5.1 Contractor shall provide sufficient, safe, and proper facilities, including equipment as necessary for safe access, at all reasonable times for observation and/or inspection of the Work by Owner and its agents. "Reasonable times" of inspection allow for sufficient monitoring of the quality of materials and installation without substantially impeding the progress of the Work.

8.5.2 Contractor shall not cover up any Work with finishing materials or other building components prior to providing Owner and its agents an opportunity to perform an inspection of the Work.

8.5.2.1 Should corrections of the Work be required for approval, Contractor shall not cover-up corrected Work until Owner indicates approval.

8.5.2.2 Contractor shall provide notification of at least five (5) working days or otherwise as mutually agreed, to ODR of the anticipated need for a cover-up inspection. Should ODR fail to make the necessary inspection within the agreed period, Contractor may proceed with cover-up Work ***after making every reasonable effort to contact the ODR and after documenting the Work***, but is not relieved of responsibility for Work to comply with requirements of the Contract Documents.

Article 9. Construction Schedules

9.1 Contract Time. **TIME IS AN ESSENTIAL ELEMENT OF THE CONTRACT**. The Contract Time is the time between the dates indicated in the Notice to Proceed for commencement of the Work and for achieving Substantial Completion. The Contract Time can be modified only by Change Order. Failure to achieve Substantial Completion within the Contract Time as otherwise agreed to in writing will cause damage to Owner and may subject Contractor to liquidated damages as provided in the Contract Documents. If Contractor fails to achieve Final Completion within thirty (30) calendar days after Substantial Completion or a mutually agreed upon longer period of time between Contractor and Owner, Contractor shall be responsible for Owner's additional inspection, project management, and maintenance cost to the extent caused by Contractor's failure to achieve Final Completion.

9.2 Notice to Proceed. Owner will issue a Notice to Proceed which shall state the dates for beginning Work and for achieving Substantial Completion of the Work.

9.3 Work Progress Schedule. Refer to Supplementary General Conditions or Special Conditions for additional schedule requirements. Unless indicated otherwise in those documents, Contractor shall submit their initial Work Progress Schedule for the Work in relation to the entire Project not later than twenty-one (21) days after the effective date of the Notice to Proceed to ODR and A/E. Unless otherwise indicated in the Contract Documents, the Work Progress Schedule shall be computerized Critical Path Method (CPM) with fully editable logic. This initial schedule shall indicate the dates for starting and completing the various aspects required to complete the Work, including mobilization, procurement, installation, testing, inspection, delivery of Close-out Documents and acceptance of all the Work of the Contract. When acceptable to Owner, the initially accepted schedule shall be the Baseline Schedule for comparison to actual conditions throughout the Contract duration.

9.3.1 Schedule Requirements. Contractor shall submit electronic and paper copy of the initial Work Progress Schedule reflecting accurate and reliable representations of the planned progress of the Work, the Work to date if any, and of Contractor's actual plans for its completion. Contractor shall organize and provide adequate detail so the schedule is capable of measuring and forecasting the effect of delaying events on completed and uncompleted activities.

9.3.1.1 Contractor shall resubmit initial schedule as required to address review comments from A/E and ODR until such schedule is accepted as the Baseline Schedule.

9.3.1.2 Submittal of a schedule, schedule revision or schedule update constitutes Contractor's representation to Owner of the accurate depiction of all progress to date and that Contractor will follow the schedule as submitted in performing the Work.

9.3.2 Schedule Updates. Contractor shall update the Work Progress Schedule and the Submittal Register monthly, as a minimum, to reflect progress to date and current plans for completing the Work, while maintaining original schedule as Baseline Schedule and submit paper and electronic copies of the update to A/E and ODR as directed, but as a minimum with each request for payment. Owner has no duty to make progress payments unless accompanied by the updated Work Progress Schedule. Show the anticipated date of completion reflecting all extensions of time granted through Change Order as of the date of the update. Contractor may revise the Work Progress Schedule when in Contractor's judgment it becomes necessary for the management of the Work. Contractor shall identify all proposed changes to schedule logic to Owner and to A/E via an executive summary accompanying the updated schedule for review prior to final implementation of revisions into a revised Baseline Schedule. Schedule changes that materially impact Owner's operations shall be communicated promptly to ODR and shall not be incorporated into the revised Baseline Schedule without ODR's consent.

9.3.3 The Work Progress Schedule is for Contractor's use in managing the Work and submittal of the schedule, and successive updates or revisions, is for the information of Owner and to demonstrate that Contractor has complied with requirements for planning the Work. Owner's acceptance of a schedule, schedule update or revision constitutes Owner's agreement to coordinate its own activities with Contractor's activities as shown on the schedule.

9.3.3.1 Acceptance of the Work Progress Schedule, or update and/or revision thereto does not indicate any approval of Contractor's proposed sequences and duration.

9.3.3.2 Acceptance of a Work Progress Schedule update or revision indicating early or late completion does not constitute Owner's consent, alter the terms of the Contract, or waive either Contractor's responsibility for timely completion or Owner's right to damages for Contractor's failure to do so.

9.3.3.3 Contractor's scheduled dates for completion of any activity or the entire Work do not constitute a change in terms of the Contract. Change Orders are the only method of modifying the Substantial Completion Date(s) and Contract Time.

9.4 Ownership of Float. Unless indicated otherwise in the Contract Documents, Contractor shall develop its schedule, pricing, and execution plan to provide a minimum of ten (10) percent total float at acceptance of the Baseline Schedule. Float time contained in the Work Progress Schedule is not for the exclusive benefit of Contractor or Owner, but belongs to the Project and may be consumed by either party as needed on a first-used basis.

9.5 Completion of Work. Contractor is accountable for completing the Work within the Contract Time stated in the Contract, or as otherwise amended by Change Order.

9.5.1 If, in the judgment of Owner, the work is behind schedule and the rate of placement of work is inadequate to regain scheduled progress to insure timely completion of the entire work or a separable portion thereof, Contractor, when so informed by Owner, shall immediately take action to increase the rate of work placement by:

9.5.1.1 An increase in working forces.

9.5.1.2 An increase in equipment or tools.

9.5.1.3 An increase in hours of work or number of shifts.

9.5.1.4 Expedite delivery of materials.

9.5.1.5 Other action proposed if acceptable to Owner.

9.5.2 Within ten (10) days after such notice from ODR, Contractor shall notify ODR in writing of the specific measures taken and/or planned to increase the rate of progress. Contactor shall include an estimate as to the date of scheduled progress recovery and an updated Work Progress Schedule illustrating Contractor's plan for achieving timely completion of the Project. Should ODR deem the plan of action inadequate, Contractor shall take additional steps or make adjustments as necessary to its plan of action until it meets with ODR's approval.

9.6 Modification of the Contract Time.

9.6.1 Delays and extension of time as hereinafter described are valid only if executed in accordance with provisions set forth in Article 11.

9.6.2 When a delay defined herein as excusable prevents Contractor from completing the Work within the Contract Time, Contractor is entitled to an extension of time. Owner will make an equitable adjustment and extend the number of days lost because of excusable delay or Weather Days, as measured by Contractor's progress schedule. All extensions of time will be granted in calendar days. In no event, however, will an extension of time be granted for delays that merely extend the duration of non-critical activities, or which only consume float without delaying the project Substantial Completion date(s).

9.6.2.1 A "Weather Day" is a day on which Contractor's current schedule indicates Work is to be done, and on which inclement weather and/or related site conditions prevent Contractor from performing seven (7) continuous hours of Work on the critical path between the hours of 7:00 a.m. and 6:00 p.m. Weather days are excusable delays. When weather conditions at the site prevent work from proceeding, Contractor shall immediately notify ODR for confirmation of the conditions. At the end of each calendar month, submit to ODR and A/E a list of Weather Days occurring in that month along with documentation of the impact on critical activities. Based on

confirmation by ODR, any time extension granted will be issued by Change Order. If Contractor and Owner cannot agree on the time extension, Owner may issue a ULCO for fair and reasonable time extension.

9.6.2.2 Excusable Delay. Contractor is entitled to an equitable adjustment of the Contract Time, issued via change order, for delays caused by the following:

9.6.2.2.1 Errors, omissions and imperfections in design, which A/E corrects by means of changes in the Drawings and Specifications.

9.6.2.2.2 Unanticipated physical conditions at the Site, which A/E corrects by means of changes to the Drawings and Specifications or for which ODR directs changes in the Work identified in the Contract Documents.

9.6.2.2.3 Failure of Owner to have secured property, right-of-way or easements necessary for Work to begin or progress.

9.6.2.2.4 Changes in the Work that effect activities identified in Contractor's schedule as "critical" to completion of the entire Work, if such changes are ordered by ODR or recommended by A/E and ordered by ODR.

9.6.2.2.5 Suspension of Work for unexpected natural events, Force Majeure (sometimes called "acts of God"), civil unrest, strikes or other events which are not within the reasonable control of Contractor.

9.6.2.2.6 Suspension of Work for convenience of ODR, which prevents Contractor from completing the Work within the Contract Time.

9.6.2.2.7 Administrative delays caused by activities or approval requirements related to an Authority Having Jurisdiction.

9.6.3 Contractor's relief in the event of such delays is the time impact to the critical path as determined by analysis of Contractor's schedule. In the event that Contractor incurs additional direct costs because of the excusable delays other than described in Subparagraph 9.6.2.2.4 and within the reasonable control of Owner, the Contract price and Contract Time are to be equitably adjusted by Owner pursuant to the provisions of Article 11.

9.7 No Damages for Delay. Contractor has no claim for monetary damages for delay or hindrances to the work from any cause, including without limitation any act or omission of Owner.

9.8 Concurrent Delay. When the completion of the Work is simultaneously delayed by an excusable delay and a delay arising from a cause not designated as excusable, Contractor may not be entitled to a time extension for the period of concurrent delay.

9.9 Other Time Extension Requests. Time extensions requested in association with changes to the Work directed or requested by Owner shall be included with Contractor's proposed costs for such change. Time extensions requested for inclement weather are covered by Paragraph 9.6.2.1 above. If Contractor believes that the completion of the Work is delayed by a circumstance other than for changes directed to the Work or weather, they shall give ODR written notice, stating the nature of the delay and the activities potentially affected, within five (5) days after the onset of the event or circumstance giving rise to the excusable delay. Contractor shall provide sufficient written evidence to document the delay. In the case of a continuing cause of delay, only one claim is necessary. State claims for extensions of time in numbers of whole or half days.

9.9.1 Within ten (10) days after the cessation of the delay, Contractor shall formalize its request for extension of time in writing to include a full analysis of the schedule impact of the delay and substantiation of the excusable nature of the delay. All changes to the Contract Time or made as a result of such claims is by Change Order, as set forth in Article 11.

9.9.2 No extension of time releases Contractor or the Surety furnishing a performance or payment bond from any obligations under the Contract or such a bond. Those obligations remain in full force until the discharge of the Contract.

9.9.3 Contents of Time Extension Requests. Contractor shall provide with each Time Extension Request a quantitative demonstration of the impact of the delay on project completion time, based on the Work Progress Schedule. Contractor shall include with Time Extension Requests a reasonably detailed narrative setting forth:

9.9.3.1 The nature of the delay and its cause; the basis of Contractor's claim of entitlement to a time extension.

9.9.3.2 Documentation of the actual impacts of the claimed delay on the critical path indicated in Contractor's Work Progress Schedule, and any concurrent delays.

9.9.3.3 Description and documentation of steps taken by Contractor to mitigate the effect of the claimed delay, including, when appropriate, the modification of the Work Progress Schedule.

9.9.4 Owner's Response. Owner will respond to the Time Extension Request by providing to Contractor written notice of the number of days granted, if any, and giving its reason if this number differs from the number of days requested by Contractor.

9.9.4.1 Owner will not grant time extensions for delays that do not affect the

Contract Substantial Completion date.

9.9.4.2 Owner will respond to each properly submitted Time Extension Request within fifteen (15) days following receipt. If Owner cannot reasonably make a determination about Contractor's entitlement to a time extension within that time, Owner will notify Contractor in writing. Unless otherwise agreed by Contractor, Owner has no more than fifteen (15) additional days to prepare a final response. If Owner fails to respond within forty-five (45) days from the date the Time Extension Request is received, Contractor is entitled to a time extension in the amount requested.

9.10 Failure to Complete Work Within the Contract Time. **TIME IS AN ESSENTIAL ELEMENT OF THE CONTRACT.** Contractor's failure to substantially complete the Work within the Contract Time or to achieve Substantial Completion as required will cause damage to Owner. These damages shall be liquidated by agreement of Contractor and Owner, in the amount per day as set forth in the Contract Documents.

9.11 Liquidated Damages. Owner may collect liquidated damages due from Contractor directly or indirectly by reducing the Contract Sum in the amount of liquidated damages stated in the Supplementary General Conditions or Special Conditions.

Article 10. Payments

10.1 Schedule of Values. Contractor shall submit to ODR and A/E for acceptance a Schedule of Values accurately itemizing material and labor for the various classifications of the Work based on the organization of the specification sections and of sufficient detail acceptable to ODR. The accepted Schedule of Values will be the basis for the progress payments under the Contract.

10.1.1 No progress payments will be made prior to receipt and acceptance of the Schedule of Values, provided in such detail as required by ODR, and submitted not less than twenty-one (21) days prior to the first request for payment. The Schedule of Values shall follow the order of trade divisions of the Specifications and include itemized costs for general conditions, costs for preparing close out documents, ***staff training, if required***, fees, contingencies, and Owner cash allowances, if applicable, so that the sum of the items will equal the Contract price. As appropriate, assign each item labor and/or material values, the subtotal thereof equaling the value of the work in place when complete.

10.1.1.1 Owner requires that the Work items be inclusive of the cost of the Work items only. Any contract markups for overhead and profit, general conditions, etc., shall be contained within separate line items for those specific purposes which shall be divided into at least two (2) lines, one (1) for labor and one (1) for materials.

10.1.2 Contractor shall retain a copy of all worksheets used in preparation of its bid or proposal, supported by a notarized statement that the worksheets are true and complete copies of the documents used to prepare the bid or proposal. Make the worksheets available to ODR at the time of Contract execution. Thereafter Contractor shall grant Owner during normal business hours access to said copy of worksheets at any time during the period commencing upon execution of the Contract and ending one year after final payment.

10.2. Progress Payments. Contractor will receive periodic progress payments for Work performed, materials in place, suitably stored on Site, or as otherwise agreed to by Owner and Contractor. Payment is not due until receipt by ODR or his designee of a correct and complete Pay Application in electronic and/or hard copy format as set forth in Supplementary General Conditions, Special Conditions, and certified by A/E. Progress payments are made provisionally and do not constitute acceptance of work not in accordance with the Contract Documents. Owner will not process progress payment applications for Change Order Work until all parties execute the Change Order.

10.2.1 Preliminary Pay Worksheet. Once each month that a progress payment is to be requested, the Contractor shall submit to A/E and ODR a complete, clean copy of a preliminary pay worksheet or preliminary pay application, to include the following:

10.2.1.1 Contractor's estimate of the amount of Work performed, labor furnished and materials incorporated into the Work, using the established Schedule of Values;

10.2.1.2 An updated Work Progress Schedule including the executive summary and all required schedule reports;

10.2.1.3 HUB subcontracting plan Progress Assessment Report as required in Paragraph 4.2.5.1;

10.2.1.4 Such additional documentation as Owner may require as set forth in the Supplementary General Conditions or elsewhere in the Contract Documents; and

10.2.1.5 Construction payment affidavit. ***The referenced affidavit is the Contractor's Progress Payment Affidavit***

10.2.2 Contractor's Application for Payment. As soon as practicable, but in no event later than seven (7) days after receipt of the preliminary pay worksheet, A/E and ODR will meet with Contractor to review the preliminary pay worksheet and to observe the condition of the Work. Based on this review, ODR and A/E may require modifications to the preliminary pay worksheet prior to the submittal of an Application for Payment, and will promptly notify Contractor of revisions necessary for approval. As soon as practicable, Contractor shall submit its Application for Payment on the appropriate and completed form, reflecting the required modifications to the Schedule of Values required by A/E and/or ODR. Attach all additional documentation required by ODR and/or A/E, as well as an affidavit affirming that all payrolls, bills for labor, materials, equipment, subcontracted work and other indebtedness connected with Contractor's Application for Payment are paid or will be paid within the time specified in Tex. Gov't Code, Ch. 2251. No Application for Payment is complete unless it fully reflects all required modifications, and attaches all required documentation including Contractor's affidavit.

10.2.3 Certification by Architect/Engineer. Within five (5) days or earlier following A/E's receipt of Contractor's formal Application for Payment, A/E will review the Application for Payment for completeness, and forward it to ODR. A/E will certify that the application is complete and payable, or that it is incomplete, stating in particular what is missing. If the Application for Payment is incomplete, Contractor shall make the required corrections and resubmit the Application for Payment for processing.

10.3 Owner's Duty to Pay. Owner has no duty to pay the Contractor except on receipt by ODR of: 1) a complete Application for Payment certified by A/E; 2) Contractor's updated Work Progress Schedule; and 3) confirmation that Contractor's record documentation at the Site is kept current.

10.3.1 Payment for stored materials and/or equipment confirmed by Owner and A/E to be on-site or otherwise properly stored is limited to eighty-five (85) percent of the invoice price or eighty-five (85) percent of the scheduled value for the materials or equipment, whichever is less.

10.3.2 Retainage. Owner will withhold from each progress payment, as retainage, five (5) percent of the total earned amount, the amount authorized by law, or as otherwise set forth in the Supplementary General Conditions or Special Conditions. Retainage is managed in conformance with Tex. Gov't Code, Ch. 2252, Subch. B. ***The Owner shall withhold as retainage ten percent (10%) of the amount of each progress payment on all contracts estimated at time of execution to cost less than $400,000 and five percent (5%) of the amount of each progress payment on all contracts estimated at the time of execution to cost $400,000 or more.***

10.3.2.1 Contractor shall provide written consent of its surety for any request for reduction or release of retainage.

10.3.2.2 At least sixty-five (65) percent of the Contract, or such other discrete Work phase as set forth in Subsection 12.1.6 or Work package delineated in the Contract Documents, must be completed before Owner can consider a retainage reduction or release.

10.3.2.3 Contractor shall not withhold retainage from their Subcontractors and suppliers in amounts that are any percentage greater than that withheld in its Contract with Owner under this subsection, unless otherwise acceptable to Owner.

10.3.3 Price Reduction to Cover Loss. Owner may reduce any Application for Payment, prior to payment to the extent necessary to protect Owner from loss on account of actions of Contractor including, but not limited to, the following:

10.3.3.1 Defective or incomplete Work not remedied;

10.3.3.2 Damage to Work of a separate Contractor;

10.3.3.3 Failure to maintain scheduled progress or reasonable evidence that the Work will not be completed within the Contract Time;

10.3.3.4 Persistent failure to carry out the Work in accordance with the Contract Documents;

10.3.3.5 Reasonable evidence that the Work cannot be completed for the unpaid portion of the Contract Sum;

10.3.3.6 Assessment of fines for violations of prevailing wage rate law; or

10.3.3.7 Failure to include the appropriate amount of retainage for that

periodic progress payment.

10.3.3.8 Failure to maintain or allow Owner's inspection of payroll records.

10.3.4 Title to all material and Work covered by progress payments transfers to Owner upon payment.

10.3.4.1 Transfer of title to Owner does not relieve Contractor and its Subcontractors of the sole responsibility for the care and protection of materials and Work upon which payments have been made until substantial completion, responsibility for the care and protection of materials and Work in areas where punch list items are completed until final completion or the restoration of any damaged Work, or waive the right of Owner to require the fulfillment of all the terms of the Contract.

10.4 Progress Payments. Progress payments to Contractor do not release Contractor or its surety from any obligations under the Contract.

10.4.1 Upon Owner's request, Contractor shall furnish manifest proof of the status of Subcontractor's accounts in a form acceptable to Owner.

10.4.2 Pay estimate certificates must be signed by a corporate officer or a representative duly authorized by Contractor.

10.4.3 Provide copies of bills of lading, invoices, delivery receipts or other evidence of the location and value of such materials in requesting payment for materials.

10.4.4 For purposes of Tex. Gov't Code § 2251.021(a)(2), the date the performance of service is complete is the date when ODR approves the Application for Payment.

10.5 Off-Site Storage. With prior approval by Owner and in the event Contractor elects to store materials at an off-site location, abide by the following conditions, unless otherwise agreed to in writing by Owner.

10.5.1 Store materials in a commercial warehouse meeting the criteria stated below.

10.5.2 Provide insurance coverage adequate not only to cover materials while in storage, but also in transit from the off-site storage areas to the Project Site. Copies of duly authenticated certificates of insurance, made out to insure the State agency which is signatory to the Contract, must be filed with Owner's representative.

10.5.3 Inspection by Owner's representative is allowed at any time. Owner's inspectors must be satisfied with the security, control, maintenance, and preservation measures.

10.5.4 Materials for this Project are physically separated and marked for the Project in a sectioned-off area. Only materials which have been approved through the submittal process are to be considered for payment.

10.5.5 Owner reserves the right to reject materials at any time prior to final acceptance of the complete Contract if they do not meet Contract requirements regardless of any previous progress payment made.

10.5.6 With each monthly payment estimate, submit a report to ODR and A/E listing the quantities of materials already paid for and still stored in the off-site location.

10.5.7 Make warehouse records, receipts and invoices available to Owner's representatives, upon request, to verify the quantities and their disposition.

10.5.8 In the event of Contract termination or default by Contractor, the items in storage off-site, upon which payment has been made, will be promptly turned over to Owner or Owner's agents at a location near the jobsite as directed by ODR. The full provisions of performance and payment bonds on this Project cover the materials off-site in every respect as though they were stored on the Project Site.

10.6 Time for Payment by Contractor Pursuant to Tex. Gov't Code § 2255.022.

10.6.1 Contractor who receives a payment from a governmental entity shall pay Subcontractor the appropriate share of the payment not later than the tenth (10^{th}) day after the date Contractor receives the payment.

10.6.2 The appropriate share is overdue on the eleventh (11^{th}) day after the date Contractor receives the payment.

Article 11. Changes

11.1 Change Orders. A Change Order issued after execution of the Contract is a written order to Contractor, signed by ODR, Contractor, and A/E, authorizing a change in the Work or an adjustment in the Contract Sum or the Contract Time. The Contract Sum and the Contract Time can only be changed by Change Order. A Change Order signed by Contractor indicates his agreement therewith, including the adjustment in the Contract Sum and/or the Contract Time. ODR may issue a written authorization for Contractor to proceed with Work of a Change Order in advance of final execution by all parties in accordance with Section 11.9.

11.1.1 Owner, without invalidating the Contract, ***and without approval of the Contractor's Surety***, may order changes in the Work within the general scope of the Contract consisting of additions, deletions or other revisions, and the Contract Sum and the Contract Time will be adjusted accordingly. All such changes in the Work shall be authorized by Change Order or ULCO, and shall be performed under the applicable conditions of the Contract Documents. If such changes cause an increase or decrease in Contractor's cost of, or time required for, performance of the Contract, an equitable adjustment shall be made and confirmed in writing in a Change Order or a ULCO.

11.1.2 It is recognized by the parties hereto and agreed by them that the Specifications and Drawings may not be complete or free from errors, omissions and imperfections or that they may require changes or additions in order for the Work to be completed to the satisfaction of Owner and that, accordingly, it is the express intention of the parties, notwithstanding any other provisions in this Contract, that any errors, omissions or imperfections in such Specifications and Drawings, or any changes in or additions to same or to the Work ordered by Owner and any resulting delays in the Work or increases in Contractor's costs and expenses arising out of such errors, shall not constitute or give rise to any claim, demand or cause of action of any nature whatsoever in favor of Contractor, whether for breach of Contract, or otherwise; provided, however, that Owner shall be liable to Contractor for the sum stated to be due Contractor in any Change Order approved and signed by both parties, it being agreed hereby that such sum, together with any extension of time contained in said Change Order, shall constitute full compensation to Contractor for all costs, expenses and damages to Contractor, as permitted under Tex. Gov't Code, Ch. 2260.

11.1.3 Procedures for administration of Change Orders shall be established by Owner and stated in Supplementary General Conditions, Special Conditions, or elsewhere in the Contract Documents. ***Procedures for administration of Change Orders will be provided at the Pre-Construction Conference.***

11.1.4 No verbal order, verbal statement, or verbal direction of Owner or his duly appointed representative shall be treated as a change under this article or entitle Contractor to an adjustment.

11.1.5 Contractor agrees that Owner or any of its duly authorized representatives shall have access and the right to examine any directly pertinent books, documents, papers, and records of Contractor. Further, Contractor agrees to include in all its subcontracts a provision to the effect that Subcontractor agrees that Owner or any of its duly authorized representatives shall have access to and the right to examine any directly pertinent books, documents, papers and records of such Subcontractor relating to any claim arising from the Contract, whether or not the Subcontractor is a party to the claim. The period of access and examination described herein which relates to appeals under the Disputes article of the Contract, litigation, or the settlement of claims arising out of the performance of the Contract shall continue until final disposition of such claims, appeals or litigation.

11.2 Unit Prices. If unit prices are stated in the Contract Documents or subsequently agreed upon, and if the quantities originally contemplated are so changed in a Proposed Change Order that application of the agreed unit prices to the quantities of work proposed will cause substantial inequity to Owner or Contractor, the applicable unit prices shall be equitably adjusted as provided in the Supplementary General Conditions or Special Conditions or as agreed to by the parties and incorporated into a Change Order.

11.3 Claims for Additional Costs.

11.3.1 If Contractor wishes to make a claim for an increase in the Contract Sum not related to a requested change, they shall give Owner and A/E written notice thereof within twenty-one (21) days after the occurrence of the event giving rise to such claim, but, in any case before proceeding to execute the Work considered to be additional cost or time, except in an emergency endangering life or property in which case Contractor shall act in accordance with Subsection 7.2.1. No such claim shall be valid unless so made. If Owner and Contractor cannot agree on the amount of the adjustment in the Contract Sum, it shall be determined as set forth under Article 15. Any change in the Contract Sum resulting from such claim shall be authorized by a Change Order or a ULCO.

11.3.2 If Contractor claims that additional cost is involved because of, but not limited to, 1) any written interpretation of the Contract Documents, 2) any order by Owner to stop the Work pursuant to Article 14 where Contractor was not at fault, or 3) any written order for a minor change in the Work issued pursuant to Section 11.4, Contractor shall make such claim as provided in Subsection 11.3.1.

11.3.3 Should Contractor or his Subcontractors fail to call attention of A/E to discrepancies or omissions in the Contract Documents, but claim additional costs for corrective Work after Contract award, Owner may assume intent to circumvent competitive bidding for necessary corrective Work. In such case, Owner may choose to let a separate Contract for the corrective Work, or issue a ULCO to require performance by Contractor. Claims for time extensions or

for extra cost resulting from delayed notice of patent Contract Document discrepancies or omissions will not be considered by Owner.

11.4 Minor Changes. A/E, with concurrence of ODR, will have authority to order minor changes in the Work not involving an adjustment in the Contract Sum or an extension of the Contract Time. Such changes shall be effected by written order which Contractor shall carry out promptly and record on As-Built ~~record~~ documents.

11.5 Concealed Site Conditions. Contractor is responsible for visiting the Site and being familiar with local conditions such as the location, accessibility, and general character of the Site and/or building. If, in the performance of the Contract, subsurface, latent, or concealed conditions at the Site are found to be materially different from the information included in the Contract Documents, or if unknown conditions of an unusual nature are disclosed differing materially from the conditions usually inherent in Work of the character shown and specified, ODR and A/E shall be notified in writing of such conditions before they are further disturbed or subsequent related work proceeds. Upon such notice, or upon its own observation of such conditions, A/E, with the approval of ODR, will promptly make such changes in the Drawings and Specifications as they deem necessary to conform to the different conditions, and any increase or decrease in the cost of the Work, or in the time within which the Work is to be completed, resulting from such changes will be adjusted by Change Order, subject to the prior approval of ODR.

11.6 Extension of Time. All changes to the Contract Time shall be made as a consequence of requests as required under Section 9.6, and as documented by Change Order as provided under Section 11.1.

11.7 Administration of Change Order Requests. All changes in the Contract shall be administered in accordance with procedures approved by Owner, and when required, make use of such electronic information management system(s) as Owner may employ.

11.7.1 Routine changes in the construction Contract shall be formally initiated by A/E by means of a PCO form detailing requirements of the proposed change for pricing by Contractor. This action may be preceded by communications between Contractor, A/E and ODR concerning the need and nature of the change, but such communications shall not constitute a basis for beginning the proposed Work by Contractor. Except for emergency conditions described below, approval of Contractor's cost proposal by A/E and ODR will be required for authorization to proceed with the Work being changed. Owner will not be responsible for the cost of Work changed without prior approval and Contractor may be required to remove Work so installed.

11.7.2 All proposed costs for change order Work must be supported by itemized accounting of material, equipment and associated itemized installation costs in sufficient detail, following the outline and organization of the established Schedule of Values, to permit analysis by A/E and ODR using current estimating guides and/or practices. Photocopies of Subcontractor and vendor proposals shall be furnished unless specifically waived by ODR. Contractor

shall provide written response to a change request within twenty-one (21) days of receipt.

11.7.3 Any unexpected circumstance which necessitates an immediate change in order to avoid a delay in progress of the Work may be expedited by verbal communication and authorization between Contractor and Owner, with written confirmation following within twenty-four (24) hours. A limited scope not-to-exceed estimate of cost and time will be requested prior to authorizing Work to proceed. Should the estimate be impractical for any reason, ODR may authorize the use of detailed cost records of such work to establish and confirm the actual costs and time for documentation in a formal Change Order.

11.7.4 Emergency changes to save life or property may be initiated by Contractor alone (see Section 7.3) with the claimed cost and/or time of such work to be fully documented as to necessity and detail of the reported costs and/or time.

11.7.5 The method of incorporating approved Change Orders into the parameters of the accepted Schedule of Values must be coordinated and administered in a manner acceptable to ODR.

11.8 Pricing Change Order Work. The amounts that Contractor and/or its Subcontractor adds to a Change Order for profit and overhead will also be considered by Owner before approval is given. The amounts established hereinafter are the maximums that are acceptable to Owner.

11.8.1 For Work performed by its forces, Contractor will be allowed their actual costs for materials, the total amount of wages (including benefits) paid for labor, plus the total cost of State and Federal payroll taxes and of worker's compensation and comprehensive general liability insurance, plus additional bond and builders risk insurance cost if the change results in an increase in the premium paid by Contractor. To the total of the above costs, Contractor will be allowed to add a percentage as noted below to cover overhead and profit combined. Allowable percentages for overhead and profit on any specific change shall not exceed fifteen (15) percent for the first $10,000 of value for self-performed work or portion thereof, ten (10) percent for the second $10,000 of value for self-performed work or portion thereof and seven and a half (7.5) percent for any value of the self-performed work that exceeds $20,000.

11.8.2 For subcontracted Work each affected Subcontractor shall figure its costs, overhead and profit as described above for Contractor's Work, all Subcontractor costs shall be combined, and to that total Subcontractor cost Contractor will be allowed to add a maximum mark-up of ten (10) percent for the first $10,000 of subcontracted Work value or portion thereof, seven and half (7.5) percent for the second $10,000 of subcontracted Work value or portion thereof, and five (5) percent for any value of the subcontracted Work exceeding $20,000.

11.8.3 On changes involving both additions and deletions, percentages for overhead and profit will be allowed only on the net addition. Owner does

not accept and will not pay for additional Contract cost identified as indirect or consequential damages.

11.8.4 For Contracts based on a Guaranteed Maximum Price (GMP), the Construction Manager-at-Risk or Design Builder shall NOT be entitled to a percentage mark-up on any Change Order Work unless the Change Order increases the Guaranteed Maximum Price.

11.8.5 ***If the parties cannot agree on an equitable adjustment for labor hours attributable to a change, they shall use the Means Facility Cost Data as a guide for labor hours as a basis of negotiation.***

11.9 Unilateral Change Order (ULCO). Owner may issue a written ULCO directing a change in the Work prior to reaching agreement with Contractor on the adjustment, if any, in the Contract price and/or the Contract Time.

11.9.1 Owner and Contractor shall negotiate for appropriate adjustments, as applicable, to the Contract Sum or the Contract Time arising out of a ULCO. As the changed Work is performed, Contractor shall submit its costs for such Work with its Application for Payment beginning with the next Application for Payment within thirty (30) days of the issuance of the ULCO. The Parties reserve their rights as to the disputed amount, subject to Article 15.

11.10 Final Resolution of Changes. Upon execution of a Change Order and /or a ULCO by Owner, Contractor and A/E, all costs and time issues regarding that change are final and not subject to additive adjustments.

Article 12. Project Completion and Acceptance

12.1 Closing Inspections.

12.1.1 Substantial Completion Inspection. When Contractor considers the entire Work or part thereof Substantially Complete, it shall notify ODR in writing ***fifteen (15) working days prior to the Substantial Completion inspection*** that the Work will be ready for Substantial Completion inspection on a specific date. Contractor shall include with this notice Contractor's Punchlist to indicate that it has previously inspected all the Work associated with the request for inspection, noting items it has corrected and included all remaining work items with date scheduled for completion or correction prior to final inspection. The failure to include any items on this list does not alter the responsibility of Contractor to complete all Work in accordance with the Contract Documents. If any of the items on this list prevents the Project from being used as intended, Contractor shall not request a Substantial Completion Inspection. Owner and its representatives will review the list of items and schedule the requested inspection, or inform Contractor in writing that such an inspection is premature because the Work is not sufficiently advanced or conditions are not as represented on Contractor's list.

12.1.1.1 Prior to the Substantial Completion inspection and as specified in the Special Conditions, Contractor shall furnish a copy of its marked-up ~~Record~~ ***As-Built*** Documents and a preliminary copy of each instructional manual, maintenance and operating manual, parts catalog, wiring diagrams, spare parts, specified written warranties, and like publications or parts for all installed equipment, systems, and like items as described in the Contract Documents. Delivery of these items is a prerequisite for requesting the Substantial Completion inspection.

12.1.1.2 On the date requested by Contractor, or as mutually agreed upon pending the status of the Open Items List, A/E, ODR, Contractor, and other Owner representatives as determined by Owner will jointly attend the Substantial Completion inspection, which shall be conducted by ODR or their delegate. If ODR determines that the Work is Substantially Complete, ODR will issue a Certificate of Substantial Completion to be signed by A/E, Owner, and Contractor establishing the date of Substantial Completion and identifying responsibilities for security, maintenance, insurance and utilities. A/E will provide with this certificate a consolidated list of Punchlist items (the pre-final Punchlist including all items noted by the various inspecting parties) for completion prior to final inspection. This list may include items in addition to those on Contractor's Punchlist, which the inspection team deems necessary to correct or complete prior to final inspection. The failure to include any items on this list does not alter the responsibility of Contractor to complete all Work in accordance with the Contract Documents. If Owner

occupies the Project upon determination of Substantial Completion, Contractor shall complete all corrective Work at the convenience of Owner, without disruption to Owner's use of the Project for its intended purposes.

12.1.2 Final Inspection. Contractor shall complete the list of items identified on the pre-final Punchlist prior to requesting a final inspection. Unless otherwise specified, or otherwise agreed in writing by the parties as documented on the Certificate of Substantial Completion, Contractor shall complete and/or correct all Work within thirty (30) days of the Substantial Completion date. Upon completion of the pre-final Punchlist work, Contractor shall give written notice to ODR and A/E that the Work will be ready for final inspection on a specific date. Contractor shall accompany this notice with a copy of the updated pre-final Punchlist indicating resolution of all items. On the date specified or as soon thereafter as is practicable, ODR, A/E and Contractor will inspect the Work. A/E will submit to Contractor a final Punchlist of open items that the inspection team requires corrected or completed before final acceptance of the Work.

12.1.2.1 Correct or complete all items on the final Punchlist before requesting Final Payment. Unless otherwise agreed to in writing by the parties, complete this work within seven (7) days of receiving the final Punchlist. Upon completion of the final Punchlist, notify A/E and ODR in writing stating the disposition of each final Punchlist item. A/E, Owner, and Contractor shall promptly inspect the completed items. When the final Punchlist is complete, and the Contract is fully satisfied according to the Contract Documents ODR will issue a certificate establishing the date of Final Completion. Completion of all Work is a condition precedent to Contractor's right to receive Final Payment.

12.1.3 Annotation. Any Certificate issued under this Article may be annotated to indicate that it is not applicable to specified portions of the Work, or that it is subject to any limitation as determined by Owner.

12.1.4 Purpose of Inspection. Inspection is for determining the completion of the Work, and does not relieve Contractor of its overall responsibility for completing the Work in a good and competent fashion, in compliance with the Contract. Work accepted with incomplete Punchlist items or failure of Owner or other parties to identify Work that does not comply with the Contract Documents or is defective in operation or workmanship does not constitute a waiver of Owner's rights under the Contract or relieve Contractor of its responsibility for performance or warranties.

12.1.5 Additional Inspections.

12.1.5.1 If Owner's inspection team determines that the Work is not substantially complete at the Substantial Completion inspection, ODR or A/E will give Contractor written notice listing cause(s) of

the rejection. Contractor will set a time for completion of incomplete or defective work acceptable to ODR. Contractor shall complete or correct all work so designated prior to requesting a second Substantial Completion inspection.

12.1.5.2 If Owner's inspection team determines that the Work is not complete at the final inspection, ODR or A/E will give Contractor written notice listing the cause(s) of the rejection. Contractor will set a time for completion of incomplete or defective work acceptable to ODR. Contractor shall complete or correct all Work so designated prior to again requesting a final inspection.

12.1.5.3 The Contract contemplates three (3) comprehensive inspections: the Substantial Completion inspection, the Final Completion inspection, and the inspection of completed final Punchlist items. The cost to Owner of additional inspections resulting from the Work not being ready for one or more of these inspections is the responsibility of Contractor. Owner may issue a ULCO deducting these costs from Final Payment. Upon Contractor's written request, Owner will furnish documentation of any costs so deducted. Work added to the Contract by Change Order after Substantial Completion inspection is not corrective Work for purposes of determining timely completion, or assessing the cost of additional inspections.

12.1.6 Phased Completion. The Contract may provide, or Project conditions may warrant, as determined by ODR, that designated elements or parts of the Work be completed in phases. Where phased completion is required or specifically agreed to by the parties, the provisions of the Contract related to closing inspections, occupancy, and acceptance apply independently to each designated element or part of the Work. For all other purposes, unless otherwise agreed by the parties in writing, Substantial Completion of the Work as a whole is the date on which the last element or part of the Work completed receives a Substantial Completion certificate.

Final Completion of the Work as a whole is the date on which the last element or part of the Work completed receives a Final Completion certificate.

12.2 Owner's Right of Occupancy. Owner may occupy or use all or any portion of the Work following Substantial Completion, or at any earlier stage of completion. Should Owner wish to use or occupy the Work, or part thereof, prior to Substantial Completion, ODR will notify Contractor in writing and identify responsibilities for security, maintenance, insurance and utilities. Work performed on the premises by third parties on Owner's behalf does not constitute occupation or use of the Work by Owner for purposes of this Article. All Work performed by Contractor after occupancy, whether in part or in whole, shall be at the convenience of Owner so as to not disrupt Owner's use of, or access to occupied areas of the Project.

12.3 Acceptance and Payment

12.3.1 Request for Final Payment. Following the certified completion of all work, including all final Punchlist items, cleanup, and the delivery of ~~record~~ ***As-Built*** documents, Contractor shall submit a certified Application for Final Payment and include all sums held as retainage and forward to A/E and ODR for review and approval.

12.3.2 Final Payment Documentation. Contractor shall submit, prior to or with the Application for Final Payment, final copies of all close out documents, maintenance and operating instructions, guarantees and warranties, certificates, ~~Record~~ ***As-Built*** Documents and all other items required by the Contract. Contractor shall submit evidence of return of access keys and cards, evidence of delivery to Owner of attic stock, spare parts, and other specified materials. Contractor shall submit consent of surety to Final Payment form and an affidavit that all payrolls, bills for materials and equipment, subcontracted work and other indebtedness connected with the Work, except as specifically noted, are paid, will be paid, after payment from Owner or otherwise satisfied within the period of time required by Tex. Gov't Code, Ch. 2251. Contractor shall furnish documentation establishing payment or satisfaction of all such obligations, such as receipts, releases and waivers of claims and liens arising out of the Contract. Contractor may not subsequently submit a claim on behalf of Subcontractor or vendor unless Contractor's affidavit notes that claim as an exception. ***The Affidavit referred to above is the Contractor's Final Payment Affidavit.***

12.3.3 Architect/Engineer Approval. A/E will review a submitted Application for Final Payment promptly but in no event later than ten (10) days after its receipt. Prior to the expiration of this deadline, A/E will either: 1) return the Application for Final Payment to Contractor with corrections for action and resubmission; or 2) accept it, note their approval, and send to Owner.

12.3.4 Offsets and Deductions. Owner may deduct from the Final Payment all sums due from Contractor. If the Certificate of Final Completion notes any Work remaining, incomplete, or defects not remedied, Owner may deduct the cost of remedying such deficiencies from the Final Payment. On such deductions, Owner will identify each deduction, the amount, and the explanation of the deduction on or by the twenty-first (21^{st}) day after Owner's receipt of an approved Application for Final Payment. Such offsets and deductions shall be incorporated via a final Change Order, including a ULCO as may be applicable.

12.3.5 Final Payment Due. Final Payment is due and payable by Owner, subject to all allowable offsets and deductions, on the thirtieth (30^{th}) day following Owner's approval of the Application for Payment. If Contractor disputes any amount deducted by Owner, Contractor shall give notice of the dispute on or before the thirtieth (30^{th}) day following receipt of Final Payment. Failure to do so will bar any subsequent claim for payment of amounts deducted.

12.3.6 Effect of Final Payment. Final Payment constitutes a waiver of all claims by Owner, relating to the condition of the Work except those arising from:

12.3.6.1 Faulty or defective Work appearing after Substantial Completion

(latent defects);

12.3.6.2 Failure of the Work to comply with the requirements of the Contract Documents;

12.3.6.3 Terms of any warranties required by the Contract, or implied by law; or

12.3.6.4 Claims arising from personal injury or property damage to third parties.

12.3.7 Waiver of Claims. Final payment constitutes a waiver of all claims and liens by Contractor except those specifically identified in writing and submitted to ODR prior to the application for Final Payment.

12.3.8 Effect on Warranty. Regardless of approval and issuance of Final Payment, the Contract is not deemed fully performed by Contractor and closed until the expiration of all warranty periods. Issuance of Final Payment does not alter Contractor's contractual obligations during the warranty period.

Article 13. Warranty and Guarantee

13.1 Contractor's General Warranty and Guarantee. Contractor warrants to Owner that all Work is executed in accordance with the Contract, complete in all parts and in accordance with approved practices and customs, and of the required finish and workmanship. Contractor further warrants that unless otherwise specified, all materials and equipment incorporated in the Work under the Contract are new. Owner may, at its option, agree in writing to waive any failure of the Work to conform to the Contract, and to accept a reduction in the Contract price for the cost of repair or diminution in value of the Work by reason of such defect. Absent such a written agreement, Contractor's obligation to perform and complete the Work in accordance with the Contract Documents is absolute and is not waived by any inspection or observation by Owner, A/E or others, by making any progress payment or final payment, by the use or occupancy of the Work or any portion thereof by Owner, at any time, or by any repair or correction of such defect made by Owner.

13.2 Warranty Period. Except as may be otherwise specified or agreed, Contractor shall repair all defects in materials, equipment, or workmanship appearing within one year from the date of Substantial Completion of the Work ***or at Final Completion if no Substantial Completion inspection is held***. If Substantial Completion occurs by phase, then the warranty period for that particular Work begins on the date of such occurrence, or as otherwise stipulated on the Certificate of Substantial Completion for the particular Work.

13.3 Limits on Warranty. Contractor's warranty and guarantee hereunder excludes defects or damage caused by:

13.3.1 Modification or improper maintenance or operation by persons other than Contractor, Subcontractors, or any other individual or entity for whom Contractor is not responsible, unless Owner is compelled to undertake maintenance or operation due to the neglect of Contractor.

13.3.2 Normal wear and tear under normal usage after acceptance of the Work by Owner.

13.4 Events Not Affecting Warranty. Contractor's obligation to perform and complete the Work in a good and workmanlike manner in accordance with the Contract Documents is absolute. None of the following will constitute an acceptance of defective Work that is not in accordance with the Contract Documents or a release of Contractor's obligation to perform the Work in accordance with the Contract Documents:

13.4.1 Observations by Owner and/or A/E;

13.4.2 Recommendation to pay any progress or final payment by A/E;

13.4.3 The issuance of a certificate of Substantial Completion or any payment by Owner to Contractor under the Contract Documents;

13.4.4 Use or occupancy of the Work or any part thereof by Owner**;**

13.4.5 Any acceptance by Owner or any failure to do so;

13.4.6 Any review of a Shop Drawing or sample submittal; or

13.4.7 Any inspection, test or approval by others.

13.5 Separate Warranties. If a particular piece of equipment or component of the Work for which the Contract requires a separate warranty is placed in continuous service before Substantial Completion, the warranty period for that equipment or component will not begin until Substantial Completion, regardless of any warranty agreements in place between suppliers and/or Subcontractors and Contractor. ODR will certify the date of service commencement in the Substantial Completion certificate.

13.5.1 In addition to Contractor's warranty and duty to repair, Contractor expressly assumes all warranty obligations required under the Contract for specific building components, systems and equipment.

13.5.2 Contractor may satisfy any such obligation by obtaining and assigning to Owner a complying warranty from a manufacturer, supplier, or Subcontractor. Where an assigned warranty is tendered and accepted by Owner which does not fully comply with the requirements of the Contract, Contractor remains liable to Owner on all elements of the required warranty not provided by the assigned warranty.

13.6 Correction of Defects. Upon receipt of written notice from Owner, or any agent of Owner designated as responsible for management of the warranty period, of the discovery of a defect, Contractor shall promptly remedy the defect(s), and provide written notice to Owner and designated agent indicating action taken. In case of emergency where delay would cause serious risk of loss or damage to Owner, or if Contractor fails to remedy within thirty (30) days, or within another period agreed to in writing, Owner may correct the defect and be reimbursed the cost of remedying the defect from Contractor or its surety.

13.7 Certification of No Asbestos Containing Materials or Work. Contractor shall ensure compliance with the Asbestos Hazard Emergency Response Act (AHERA– 40 C.F.R § 763-99(7)) from all Subcontractors and materials suppliers, and shall provide a notarized certification to Owner that all equipment and materials used in fulfillment of their Contract responsibilities are non-Asbestos Containing Building Materials (ACBM). This certification must be provided no later than Contractor's application for Final Payment.

Article 14. Suspension and Termination

14.1 Suspension of Work for Cause. Owner may, at any time without prior notice, suspend all or any part of the Work, if after reasonable observation and/or investigation, Owner determines it is necessary to do so to prevent or correct any condition of the Work, which constitutes an immediate safety hazard, or which may reasonably be expected to impair the integrity, usefulness or longevity of the Work when completed.

14.1.1 Owner will give Contractor a written notice of suspension for cause, setting forth the reason for the suspension and identifying the Work suspended. Upon receipt of such notice, Contractor shall immediately stop the Work so identified. As soon as practicable following the issuance of such a notice, Owner will initiate and complete a further investigation of the circumstances giving rise to the suspension, and issue a written determination of the findings.

14.1.2 If it is confirmed that the cause was within the control of Contractor, Contractor will not be entitled to an extension of time or any compensation for delay resulting from the suspension. If the cause is determined not to have been within the control of Contractor, and the suspension has prevented Contractor from completing the Work within the Contract Time, the suspension is an excusable delay and a time extension will be granted through a Change Order.

14.1.3 Suspension of Work under this provision will be no longer than is reasonably necessary to remedy the conditions giving rise to the suspension.

14.2 Suspension of Work for Owner's Convenience. Upon seven (7) days written notice to Contractor, Owner may at any time without breach of the Contract suspend all or any portion of the Work for a period of up to thirty (30) days for its own convenience. Owner will give Contractor a written notice of suspension for convenience, which sets forth the number of suspension days for which the Work, or any portion of it, and the date on which the suspension of Work will cease. When such a suspension prevents Contractor from completing the Work within the Contract Time, it is an excusable delay. A notice of suspension for convenience may be modified by Owner at any time on seven (7) days written notice to Contractor. If Owner suspends the Work for its convenience for more than sixty (60) consecutive days, Contractor may elect to terminate the Contract pursuant to the provisions of the Contract.

14.3 Termination by Owner for Cause.

14.3.1 Upon written notice to Contractor and its surety, Owner may, without prejudice to any right or remedy, terminate the Contract and take possession of the Site and of all materials, equipment, tools, construction equipment, and machinery thereon owned by Contractor under any of the following circumstances:

14.3.1.1 Persistent or repeated failure or refusal, except during complete or partial suspensions of work authorized under the Contract, to supply enough properly skilled workmen or proper materials;

14.3.1.2 Persistent disregard of laws, ordinances, rules, regulations or orders of any public authority having jurisdiction, including ODR;

14.3.1.3 Persistent failure to prosecute the Work in accordance with the Contract, and to ensure its completion within the time, or any approved extension thereof, specified in the Contract;

14.3.1.4 Failure to remedy defective work condemned by ODR;

14.3.1.5 Failure to pay Subcontractors, laborers, and material suppliers pursuant to Tex. Gov't Code, Ch. 2251;

14.3.1.6 Persistent endangerment to the safety of labor or of the Work;

14.3.1.7 Failure to supply or maintain statutory bonds or to maintain required insurance, pursuant to the Contract;

14.3.1.8 Any material breach of the Contract; or

14.3.1.9 Contractor's insolvency, bankruptcy, or demonstrated financial inability to perform the Work.

14.3.2 Failure by Owner to exercise the right to terminate in any instance is not a waiver of the right to do so in any other instance.

14.3.3 Should Owner decide to terminate the Contract under the provisions of Section 14.3, it will provide to Contractor and its surety thirty (30) days prior written notice.

14.3.4 Should Contractor or its surety, after having received notice of termination, demonstrate to the satisfaction of Owner that Contractor or its surety are proceeding to correct such default with diligence and promptness, upon which the notice of termination was based, the notice of termination may be rescinded in writing by Owner. If so rescinded, the Work may continue without an extension of time.

14.3.5 If Contractor or its surety fails, after written notice from Owner to commence and continue correction of such default with diligence and promptness to the satisfaction of Owner within thirty (30) days following receipt of notice, Owner may arrange for completion of the Work and deduct the cost of completion from the unpaid Contract Sum.

14.3.5.1 This amount includes the cost of additional Owner costs such as A/E services, other consultants, and contract administration.

14.3.5.2 Owner will make no further payment to Contractor or its surety unless the costs to complete the Work are less than the Contract balance, then the difference shall be paid to Contractor or its surety. If such costs exceed the unpaid balance, Contractor or its surety will pay the difference to Owner.

14.3.5.3 This obligation for payment survives the termination of the Contract.

14.3.5.4 Owner reserves the right in termination for cause to take assignment of all the Contracts between Contractor and its Subcontractors, vendors, and suppliers. ODR will promptly notify Contractor of the contracts Owner elects to assume. Upon receipt of such notice, Contractor shall promptly take all steps necessary to effect such assignment.

14.4 Conversion to Termination for Convenience. In the event that any termination of Contractor for cause under Section 14.3 is later determined to have been improper, the termination shall automatically convert to a termination for convenience under Section 14.5 and Contractor's recovery for termination shall be strictly limited to the payments allowable under Section 14.5.

14.5 Termination for Convenience of Owner. Owner reserves the right, without breach, to terminate the Contract prior to, or during the performance of the Work, for any reason. Upon such an occurrence, the following shall apply:

14.5.1 Owner will immediately notify Contractor and A/E in writing, specifying the reason for and the effective date of the Contract termination. Such notice may also contain instructions necessary for the protection, storage or decommissioning of incomplete work or systems, and for safety.

14.5.2 Upon receipt of the notice of termination, Contractor shall immediately proceed with the following obligations, regardless of any delay in determining or adjusting any amounts due at that point in the Contract:

14.5.2.1 Stop all work.

14.5.2.2 Place no further subcontracts or orders for materials or services.

14.5.2.3 Terminate all subcontracts for convenience.

14.5.2.4 Cancel all materials and equipment orders as applicable.

14.5.2.5 Take action that is necessary to protect and preserve all property related to the Contract which is in the possession of Contractor.

14.5.3 When the Contract is terminated for Owner's convenience, Contractor may recover from Owner payment for all Work executed. Contractor may not claim lost profits on other work or lost business opportunities.

14.6 Termination By Contractor. If the Work is stopped for a period of ninety (90) days under an order of any court or other public authority having jurisdiction, or as a result of an act of government, such as a declaration of a national emergency making materials unavailable, through no act or fault of Contractor or Subcontractor or their agents or employees or any other persons performing any of the Work under a contract with Contractor, then Contractor may, upon thirty (30) additional days written notice to ODR, terminate the Contract and recover from Owner payment for all Work executed, but not lost profits on other work or lost business opportunities. If the cause of the Work stoppage is removed prior to the end of the thirty (30) day notice period, Contractor may not terminate the Contract.

14.7 Settlement on Termination. When the Contract is terminated for any reason, at any time prior to one hundred eighty (180) days after the effective date of termination, Contractor shall submit a final termination settlement proposal to Owner based upon recoverable costs as provided under the Contract. If Contractor fails to submit the proposal within the time allowed, Owner may determine the amount due to Contractor because of the termination and pay the determined amount to Contractor.

Article 15. Dispute Resolution

15.1 Unresolved Contractor Disputes. The dispute resolution process provided for in Tex. Gov't Code, Ch. 2260, ***and the procedures provided in Title 31, Part 2, Chapter 51, Subchapter J of the Texas Administrative*** or Tex. Civ. Prac. & Rem. Code, Ch. 114, shall be used by Contractor to attempt to resolve any claim for breach of Contract made by Contractor that is not resolved under procedures described throughout the Uniform General Conditions, Supplementary Conditions, or Special Conditions of the Contract.

15.2 Alternative Dispute Resolution Process. Owner may establish a dispute resolution process to be utilized in advance of that outlined in Tex. Gov't Code, Ch. 2260 or Tex. Civ. Prac. & Rem. Code, Ch. 114.

15.3 Nothing herein shall hinder, prevent, or be construed as a waiver of Owner's right to seek redress on any disputed matter in a court of competent jurisdiction.

15.4 Nothing herein shall waive or be construed as a waiver of the State's sovereign immunity.

Article 16. Miscellaneous

16.1 Supplementary General and Special Conditions. When the Work contemplated by Owner is of such a character that the foregoing Uniform General Conditions of the Contract cannot adequately cover necessary and additional contractual relationships, the Contract may include Supplementary General and Special Conditions as described below:

16.1.1 Supplementary General Conditions may describe the standard procedures and requirements of contract administration followed by a contracting agency of the State. Supplementary General Conditions may expand upon matters covered by the Uniform General Conditions, where necessary, provided the expansion does not weaken the character or intent of the Uniform General Conditions. Supplementary General Conditions are of such a character that it is to be anticipated that a contracting agency of the State will normally use the same, or similar, conditions to supplement each of its several projects.

16.1.2 Special Conditions shall relate to a particular Project and be unique to that Project but shall not weaken the character or intent of the Uniform General Conditions.

16.2 Federally Funded Projects. On Federally funded projects, Owner may waive, suspend or modify any Article in these Uniform General Conditions which conflicts with any Federal statue, rule, regulation or procedure, where such waiver, suspension or modification is essential to receipt by Owner of such Federal funds for the Project. In the case of any Project wholly financed by Federal funds, any standards required by the enabling Federal statute, or any Federal rules, regulations or procedures adopted pursuant thereto, shall be controlling.

16.3 Internet-based Project Management Systems. At its option, Owner may administer its design and construction management through an Internet-based management system. In such cases, Contractor shall conduct communication through this media and perform all Project related functions utilizing this database system. This includes correspondence, submittals, Requests for Information, vouchers or payment requests and processing, amendment, Change Orders and other administrative activities.

16.3.1 Accessibility and Administration.

16.3.1.1 When used, Owner will make the software accessible via the Internet to all Project team members.

16.3.1.2 Owner shall administer the software.

16.3.2 Training. When used, Owner shall provide training to the Project team members.

16.4 Administrative Inspections and Audits. Contractor agrees that all relevant records related to this Contract or any work product under this Contract, including practices of

its Subcontractors, shall be subject, at any reasonable time, to inspection, examination, review, audit, and copying at any office or location of Contractor where such records may be found, with or without notice by the Texas State Auditor's Office ("SAO"), the contracting agency or its contracted examiners, or the Office of the Texas Attorney General, and with regard to any federal funding, the relevant federal agency, the Comptroller General, the General Accounting Office, the Office of the Inspector General, or any of their authorized representatives. All Subcontracts shall reflect the requirements of this section. In addition, pursuant to Tex. Gov't Code§ 2262.003 the SAO may conduct an audit or investigation of any entity receiving funds under this Contract, including direct payments to Contractor and indirect payments under a Subcontract to this Contract; acceptance of such monies acts as acceptance of SAO authority, under legislative audit committee direction, to audit and investigate related to those funds and the entity subject to the audit or investigation must provide SAO with access to any information SAO considers relevant to the scope of the audit or investigation.

End of Uniform General Conditions

2018 SUPPLEMENTARY GENERAL CONDITIONS TO THE STATE OF TEXAS 2015 EDITION OF THE UNIFORM GENERAL CONDITIONS FOR CONSTRUCTION CONTRACTS

The following Supplementary General Conditions amend and/or supplement the 2015 edition of the Uniform General Conditions for Construction Contracts.

Article 5. Bonds and Insurance

5.2 Insurance Requirements.

Subsection 5.2.4 is supplemented to add the following new paragraphs:

5.2.4.1 Contractor shall deliver to Owner true and complete copies of the General Contractor's certificates prior to the issuance of any Notice to Proceed.

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

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

5.2.4.4 The insurance coverage and limits established in the Uniform General Conditions, Supplementary General Conditions, or Special Conditions shall not be interpreted as any representation or warranty that the insurance coverage and limits necessarily will be adequate to protect Contractor.

Article 2. Wage Rates and Other Laws Governing Construction

Add Section 2.7 as follows:

2.7 Buy America Requirements for Iron and Steel Used in Construction. In accordance with Texas Government Code 2252, Section 2252.202, all iron or steel products (i.e., rolled structural shapes including wide flange beams and columns, angles, bars, plates, sheets, hollow structural sections, pipe, etc.) shall be produced, manufactured and fabricated in the United States.

End of Supplementary General Conditions

EXHIBIT A
OWNER'S INSURANCE REQUIREMENTS OF CONTRACTOR

1.0 **Definitions.** For purposes of this Contract:

1.1 Owner Parties. "Owner Parties" means the State of Texas and any Agency of the State of Texas, acting through the responsible entity of the State of Texas identified in the Contract as the Owner. **Owner herein shall mean the Texas Parks and Wildlife Department**.

1.2 Contractor. "Contractor" shall mean the vendor providing the service or work to be performed under this Contract.

1.3 Subcontractor. "Subcontractor" shall include subcontractors of any tier.

1.4 ISO. "ISO" means Insurance Services Office.

2.0 **Contractor Insurance Representations to Owner Parties**

2.1 It is expressly understood and agreed that the insurance coverages required herein:

2.1.1 Represent Owner Parties' minimum requirements and are not to be construed to void or limit the Contractor's indemnity obligations as contained in this Contract nor represent in any manner a determination of the insurance coverages the Contractor should or should not maintain for its own protection; and

2.1.2 are being, or have been, obtained by the Contractor in support of the Contractor's liability and indemnity obligations under this Contract. Irrespective of the requirements as to insurance to be carried as provided for herein, the insolvency, bankruptcy or failure of any insurance company carrying insurance of the Contractor, or the failure of any insurance company to pay claims accruing, shall not be held to affect, negate or waive any of the provisions of this Contract.

2.2 Failure to obtain and maintain the required insurance shall constitute a material breach of, and default under, this Contract. If the Contractor shall fail to remedy such breach within five (5) business days after notice by the Owner, the Contractor will be liable for any and all costs, liabilities, damages and penalties resulting to the Owner Parties from such breach, unless a written waiver of the specific insurance requirement(s) is provided to the Contractor by the Owner. In the event of any failure by the Contractor to comply with the provisions of this Contract, the Owner may, without in any way compromising or waiving any right or remedy at law or in equity, on notice to the Contractor, purchase such insurance, at the Contractor's expense, provided that the Owner shall have no obligation to do so and if the Owner shall do so, the Contractor shall not be relieved of or excused from the obligation to obtain and maintain such insurance amounts and coverages.

2.3 This Exhibit is an independent contract provision and shall survive the termination or expiration of the Construction Contract.

3.0 **Conditions Affecting All Insurance Required Herein**

3.1 Cost of Insurance. All insurance coverage shall be provided at the Contractor's sole expense.

3.2 Status and Rating of Insurance Company. All insurance coverage shall be written through insurance companies authorized to do business in the state in which the work is to be performed and rated no less than A-: VII in the most current edition of A. M. Best's Key Rating Guide.

3.3 Restrictive, Limiting, or Exclusionary Endorsements. All insurance coverage shall be provided to the Owner Parties in compliance with the requirements herein and shall contain no endorsements that restrict, limit, or exclude coverage required herein in any manner without the prior express written approval of the Owner.

3.4 Limits of Liability. The limits of liability may be provided by a single policy of insurance but in no event shall the total limits of liability available for any one occurrence or accident be less than the amount required herein.

3.5 Notice of Cancellation or Material Reduction in Coverage. All insurance coverage shall contain the following express provision:

> In the event of cancellation, material change in coverage, or a non-renewal affecting the Owner as certificate holder, thirty (30) days prior written notice shall be given to the certificate holder.

3.6 Waiver of Subrogation. The Contractor hereby agrees to waive its rights of recovery from the Owner Parties with regard to all causes of property and/or liability loss and shall cause a waiver of subrogation endorsement to be provided in favor of the Owner Parties on all insurance coverage carried by the Contractor, whether required herein or not.

3.7 Deductible/Retention. Except as otherwise specified herein, no insurance required herein shall contain a deductible or self-insured retention in excess of $25,000 without prior written approval of the Owner. All deductibles and/or retentions shall be paid by, assumed by, for the account of, and at the Contractor's sole risk. The Contractor shall not be reimbursed for same.

4.0 **Maintenance of Insurance**. The following insurance shall be maintained in effect with limits not less than those set forth below at all times during the term of this Contract and thereafter as required:

4.1 **Commercial General Liability Insurance**

4.1.1 Coverage. Such insurance shall cover liability arising out of all locations and operations of the Contractor, including but not limited to liability assumed under this contract (including the tort liability of another assumed in a business contract). Defense shall be provided as an additional benefit and not included within the limit of liability.

4.1.2 Form. Commercial General Liability Occurrence form (at least as broad as an unmodified ISO CG 0001 0798 or its equivalent).

4.1.3 Amount of Insurance. Coverage shall be provided with limits of not less than:

Each Occurrence Limit	$1,000,000
General Aggregate Limit	$2,000,000
Product-Completed Operations Aggregate Limit	$2,000,000
Personal and Advertising Liability	$1,000,000
Damages to Premises Rented to You	$50,000
Medical Expense each person	$5,000

4.1.4 Required Endorsements

a. Additional Insured. Additional insured status shall be provided in favor of the Owner Parties on ISO forms CG 20 10 or its equivalent.
b. Notice of Cancellation or Material Reduction in Coverage, as required in 3.5, above.
c. Primary and Non-Contributing Liability. It is the intent of the parties to this Contract that all insurance coverage required herein shall be primary to and shall

seek no contribution from all insurance available to Owner Parties, with Owner Parties' insurance being excess, secondary and non-contributing. This CGL coverage shall be endorsed to provide such primary and non-contributing liability coverage.

d. Waiver of Subrogation, as required in 3.6, above.

4.1.5 Continuing Commercial General Liability Insurance. The Contractor shall maintain such insurance in identical coverage, form and amount, including required endorsements, for the duration of the contract and the warranty period.

4.2 **Business Auto Liability Insurance**

4.2.1 Coverage. Such insurance shall cover liability arising out of any auto (including owned, hired, and non-owned).

4.2.2 Form. Business Auto form (at least as broad as an unmodified ISO CA 0001 or its equivalent).

4.2.3 Amount of Insurance. Coverage shall be provided with a limit of not less than $1,000,000.

4.2.4 Required Endorsements

a. Notice of Cancellation or Material Reduction in Coverage, as required in 3.5, above.
b. Waiver of Subrogation, as required in 3.6, above.

4.3 **Workers' Compensation/Employer's Liability Insurance**

4.3.1 Coverage. Such insurance shall cover liability arising out of the Contractor's employment of workers and anyone for whom the Contractor may be liable for workers' compensation claims. Workers' compensation insurance is required, and no "alternative" forms of insurance shall be permitted. USL&H must be provided where such exposure exists.

By signing the Contract or providing or causing to be provided a certificate of coverage, Contractor is representing to Owner 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 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 Texas Worker's Compensation Commission. Providing false or misleading information may subject Contractor to administrative penalties, criminal penalties, civil penalties or other civil actions.

4.3.2 Amount of Insurance. Coverage shall be provided with a limit of not less than:

Workers' Compensation:	Statutory limits.
Employer's Liability:	
Bodily Injury by Accident	$1,000,000 Ea. Accident
Bodily Injury by Disease	$1,000,000 Ea. Employee
Bodily Injury by Disease	$1,000,000 Policy Limit

4.3.3 Required Endorsements

a. Notice of Cancellation or Material Reduction in Coverage, as required in 3.5, above.
b. Waiver of Subrogation, as required in 3.6, above.

4.4 **RESERVED**

4.5 **RESERVED**

4.6 **Hazardous Materials Insurance**

For Work which involves asbestos or any hazardous materials or pollution defined as asbestos, CONTRACTOR or Subcontractor responsible for the Work shall comply with the following insurance requirements in addition to those specified above:

a. Provide an asbestos abatement endorsement to the Commercial General Liability policy with minimum bodily injury and property damage limits of $1,000,000 per occurrence and products/completed operations coverage with a separate aggregate of $2,000,000. This policy shall not exclude asbestos or any hazardous materials or pollution defined as asbestos, and shall provide "occurrence" coverage without a sunset clause. The policy shall provide 30 day Notice of Cancellation and Waiver of Subrogation endorsements in favor of OWNER.

b. CONTRACTOR or Subcontractor responsible for transporting asbestos or any hazardous materials defined as asbestos shall provide pollution coverage. Federal law requires interstate or intrastate transporters of asbestos to provide an MCS 90 endorsement with a $5,000,000 limit when transporting asbestos in bulk in conveyances of gross vehicle weight rating of 10,000 pounds or more. Interstate transporters of asbestos in non-bulk in conveyances of gross vehicle weight rating of 10,000 pounds or more must provide an MCS 90 endorsement with a $1,000,000 limit. The terms "conveyance" and "bulk" are defined by Title 49 CFR 171.8. All other transporters of asbestos shall provide either an MCS 90 endorsement with minimum limits of $1,000,000 or an endorsement to their Commercial General Liability Insurance policy which provides coverage for bodily injury and property damage arising out of the transportation of asbestos. The endorsement shall, at a minimum, provide a $1,000,000 limit of liability and cover events caused by the hazardous properties of airborne asbestos arising from fire, wind, hail, lightning, overturn of conveyance, collision with other vehicles or objects, and loading and unloading of conveyances.

c. CONTRACTOR shall submit complete copies of the policy providing pollution liability coverage to OWNER.

5.0 **RESERVED**

6.0 **Evidence of Insurance**

6.1 Provision of Evidence. Evidence of the insurance coverage required to be maintained by the Contractor, represented by certificates of insurance, evidence of insurance, and endorsements issued by the insurance company or its legal agent, and must be furnished to the Owner prior to commencement of Work and not later than ten (10) days after receipt of the Notice of Intent to Award. New certificates of insurance, evidence of insurance, and endorsements shall be provided to the Owner prior to the termination date of the current certificates of insurance, evidence of insurance, and endorsements.

6.2 Form and Specifications. Such certificates of insurance and/or evidence of insurance shall specify:

6.2.1 The Owner as a certificate holder with correct mailing address.

6.2.2 Insured's name, which must match that on this Contract.
6.2.3 Insurance companies affording each coverage, policy number of each coverage, policy dates of each coverage, all coverages and limits described herein, and signature of authorized representative of insurance company.
6.2.4 Producer of the certificate with correct address and phone number listed.
6.2.5 Additional insured status required herein.
6.2.6 Amount of any deductibles and/or retentions.
6.2.7 Cancellation, non-renewal and material reduction in coverage notification as required by this Contract.
6.2.8 Designated Construction Project Aggregate Limits required herein.
6.2.9 Personal Injury contractual liability required herein.
6.2.10 Primary and non-contributing status required herein.
6.2.11 Waivers of subrogation required herein.
6.2.12 The certificate of insurance shall list all exclusions and limitations added by endorsement to the general liability insurance coverage

6.3 Required Endorsements. A general liability additional insured endorsement shall also be provided.

6.4 Failure to Obtain. Failure of any Owner Party to demand such certificate or other evidence of full compliance with these insurance requirements or failure of any Owner Party to identify a deficiency from evidence that is provided shall not be construed as a waiver of the Contractor's obligation to maintain such insurance.

6.5 Certified Copies. Upon request of any Owner Party, the Contractor shall provide to the Owner a certified copy of all insurance policies required herein within ten (10) days of any such request. Renewal policies, if necessary, shall be delivered to the Owner prior to the expiration of the previous policy.

6.6 Commencement of Work. Commencement of Work without provision of the required certificate of insurance, evidence of insurance and/or required endorsements, or without compliance with any other provision of this Contract, shall not constitute a waiver by any Owner Party of any rights. The Owner shall have the right, but not the obligation, of prohibiting the Contractor or any subcontractor from performing any Work until such certificate of insurance, evidence of insurance and/or required endorsements are received and approved by the Owner.

7.0 **Insurance Requirements of Contractor's Subcontractors**

7.1 Insurance similar to that required of the Contractor shall be provided by all subcontractors (or provided by the Contractor on behalf of subcontractors) to cover operations performed under any subcontract Contract. The Contractor shall be held responsible for any modification in these insurance requirements as they apply to subcontractors. The Contractor shall maintain certificates of insurance from all subcontractors containing provisions similar to those listed herein (modified to recognize that the certificate is from subcontractor) enumerating, among other things, the waivers of subrogation, additional insured status, and primary liability as required herein, and make them available to the Owner upon request.

7.2 The Contractor is fully responsible for loss and damage to its property on the site, including tools and equipment, and shall take necessary precautions to prevent damage to or vandalism, theft, burglary, pilferage and unexplained disappearance of property. Any insurance covering the Contractor's or its subcontractor's property shall be the Contractor's and its subcontractor's sole and complete means or recovery for any such loss. To the extent any loss is not covered by said insurance or subject to any deductible or co-insurance, the Contractor shall not be reimbursed for same. Should the Contractor or its subcontractors choose to self insure this risk, it is expressly agreed that the Contractor hereby waives, and shall cause its subcontractors to waive, any claim for damage or loss to said property in favor of the Owner Parties.

8.0 **Use of the Owner's Equipment.** The Contractor, its agents, employees, subcontractors or suppliers shall use the Owner's equipment only with express written permission of the Owner's designated representative and in accordance with the Owner's terms and condition for such use. If the Contractor or any of its agents, employees, subcontractors or suppliers utilize any of the Owner's equipment for any purpose, including machinery, tools, scaffolding, hoists, lifts or similar items owned, leased or under the control of the Owner, the Contractor shall defend, indemnify and be liable to the Owner Parties for any and all loss or damage which may arise from such use.

9.0 **Release and Waiver**. The Contractor hereby releases, and shall cause its subcontractors to release, the Owner Parties from any and all claims or causes of action whatsoever which the Contractor and/or its subcontractors might otherwise now or hereafter possess resulting in or from or in any way connected with any loss covered by insurance, whether required herein or not, or which should have been covered by insurance required herein, including the deductible and/or uninsured portion thereof, maintained and/or required to be maintained by the Contractor and/or its subcontractors pursuant to this Contract.

TEXAS PARKS AND WILDLIFE

PREVAILING WAGE RATE DETERMINATION INFORMATION

Chapter 2258, Texas Government Code, Title 10 requires that state agencies, (including universities), cities, counties, independent school districts, and all other political subdivisions that engage in public works construction projects produce and include prevailing wage rate determinations in the project bidding and contract documents.

Chapter 2258 requires that the contractor who is awarded a contract by a public body and a contractor's subcontractor shall pay not less than the rates determined by such state agencies to workers employed for the execution of such work. Pursuant to Chapter 2258, Texas Parks and Wildlife has ascertained the following wages to be paid for the various classifications of workers, in the locality of this project. In determining these wages, TPWD has utilized the Prevailing Wage Rates as determined by the U.S. DOL in accordance with the Davis-Bacon Act.

See attached wage rate document.

General Decision Number: TX180298 01/12/2018 TX298

Superseded General Decision Number: TX20170298

State: Texas

Construction Type: Building

County: Galveston County in Texas.

BUILDING CONSTRUCTION PROJECTS (does not include single family homes or apartments up to and including 4 stories).

Note: Under Executive Order (EO) 13658, an hourly minimum wage of $10.35 for calendar year 2018 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 $10.35 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 2018. 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	01/05/2018
1	01/12/2018

ASBE0022-009 06/01/2017

	Rates	Fringes
ASBESTOS WORKER/HEAT & FROST INSULATOR (Duct, Pipe and Mechanical System Insulation)	$ 23.26	12.92

BOIL0074-003 01/01/2017

	Rates	Fringes
BOILERMAKER	$ 28.00	22.35

CARP0551-011 04/01/2016

	Rates	Fringes
CARPENTER (Excludes Acoustical Ceiling Installation, Drywall Finishing/Taping, Drywall Hanging, Form Work and Metal Stud Installation)	$ 23.05	8.78

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* ELEC0527-002 01/01/2018

	Rates	Fringes
ELECTRICIAN (Excludes Low Voltage Wiring and Installation of Alarms)	$ 28.19	3% + 10.42

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* ELEV0031-003 01/01/2018

	Rates	Fringes
ELEVATOR MECHANIC	$ 41.28	32.645+a+b

FOOTNOTES:

A. 6% under 5 years based on regular hourly rate for all hours worked. 8% over 5 years based on regular hourly rate for all hours worked.

B. Holidays: New Year's Day; Memorial Day; Independence Day; Labor Day; Thanksgiving Day; Friday after Thanksgiving Day; Christmas Day; and Veterans Day.

ENGI0450-002 04/01/2014

	Rates	Fringes
POWER EQUIPMENT OPERATOR Cranes	$ 34.85	9.85

IRON0084-011 06/01/2017

	Rates	Fringes
IRONWORKER, ORNAMENTAL	$ 23.27	7.12

PAIN0130-002 06/01/2017

	Rates	Fringes
PAINTER (Brush, Roller, and Drywall Finishing/Taping)	$ 17.60	8.91

PLAS0079-004 01/01/2015

	Rates	Fringes
PLASTERER	$ 19.92	1.00

PLUM0068-002 10/01/2017

	Rates	Fringes
PLUMBER	$ 34.90	10.54

PLUM0211-010 10/01/2017

	Rates	Fringes
PIPEFITTER (Including HVAC Pipe Installation)	$ 34.10	11.71

SHEE0054-012 07/01/2017

	Rates	Fringes
SHEET METAL WORKER		
Excludes HVAC Duct and Unit Installation	$ 27.72	13.70
HVAC Duct Installation Only	$ 27.72	13.70

SUTX2014-024 07/21/2014

	Rates	Fringes
ACOUSTICAL CEILING MECHANIC	$ 16.41	3.98
BRICKLAYER	$ 19.86	0.00
CAULKER	$ 15.36	0.00
CEMENT MASON/CONCRETE FINISHER	$ 13.82	0.00
DRYWALL HANGER AND METAL STUD INSTALLER	$ 17.88	5.24
ELECTRICIAN (Alarm Installation Only)	$ 17.97	3.37
ELECTRICIAN (Low Voltage Wiring Only)	$ 19.23	3.55
FLOOR LAYER: Carpet	$ 20.00	0.00
FORM WORKER	$ 12.07	0.00
GLAZIER	$ 17.09	3.41
HVAC MECHANIC (Installation of HVAC Unit Only)	$ 17.40	0.00
IRONWORKER, REINFORCING	$ 12.10	0.00
IRONWORKER, STRUCTURAL	$ 25.37	6.00
LABORER: Common or General	$ 11.47	0.00
LABORER: Mason Tender - Brick	$ 13.37	0.00

LABORER: Mason Tender - Cement/Concrete	$ 10.50	0.00
LABORER: Pipelayer	$ 12.94	0.00
LABORER: Roof Tearoff	$ 11.28	0.00
LABORER: Landscape and Irrigation	$ 9.49	0.00
LATHER	$ 20.11	0.00
OPERATOR: Backhoe/Excavator/Trackhoe	$ 14.10	0.00
OPERATOR: Bobcat/Skid Steer/Skid Loader	$ 13.93	0.00
OPERATOR: Bulldozer	$ 20.77	0.00
OPERATOR: Drill	$ 16.22	0.34
OPERATOR: Forklift	$ 15.64	0.00
OPERATOR: Grader/Blade	$ 13.37	0.00
OPERATOR: Loader	$ 13.55	0.94
OPERATOR: Mechanic	$ 17.52	3.33
OPERATOR: Paver (Asphalt, Aggregate, and Concrete)	$ 16.03	0.00
OPERATOR: Roller	$ 16.00	0.00
PAINTER: Spray (Excludes Drywall Finishing/Taping)	$ 17.43	4.43
ROOFER	$ 15.40	0.00
SPRINKLER FITTER (Fire Sprinklers)	$ 18.62	3.03
TILE FINISHER	$ 12.00	0.00
TILE SETTER	$ 16.17	0.00
TRUCK DRIVER: 1/Single Axle Truck	$ 14.95	5.23
TRUCK DRIVER: Dump Truck	$ 12.39	1.18
TRUCK DRIVER: Flatbed Truck	$ 19.65	8.57
TRUCK DRIVER: Semi-Trailer Truck	$ 12.50	0.00
TRUCK DRIVER: Water Truck	$ 12.00	4.11
WATERPROOFER	$ 14.39	0.00

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.

END OF GENERAL DECISION

TEXAS PARKS AND WILDLIFE

AGREEMENT BETWEEN OWNER AND CONTRACTOR

STATE OF TEXAS PROJECT NO. 128696

COUNTY OF TRAVIS CONTRACT NO. _____

THIS AGREEMENT, made this _____day of _____, 20__ by and between the STATE OF TEXAS, acting through the **TEXAS PARKS AND WILDLIFE DEPARTMENT**, hereinafter called the OWNER, and **INSERT CONTRACTOR COMPANY NAME**, hereinafter called the CONTRACTOR.

WITNESSETH: That for and in consideration of the payments and agreements hereinafter described, to be made and performed by the OWNER, the CONTRACTOR hereby agrees with the OWNER to commence and complete certain public works described as: **Project No. 128696 – Flood Repairs, CF Dickinson Marine Laboratory, Galveston County, Texas**, for the use and benefit of the OWNER as described in the Bidding and Contract Documents prepared by TEXAS PARKS AND WILDLIFE DEPARTMENT. Contract Documents include all parts of this Invitation to Bids, including but not limited to, Specifications, Scope of Work, Uniform General and Supplementary General Conditions, and Special Conditions for **Project Number 128696**. The Contract Documents are hereby incorporated by reference into this **Contract Number _____.**

In the event that there is a conflict, this contract and its attachments take priority over all other documents. Following the contract in order of priority are the Special Conditions; Supplementary General Conditions, Uniform General Conditions; Invitations for Bids and Contract Documents, and Contractor's Bid.

The consideration to be paid by the OWNER to the CONTRACTOR for furnishing all the materials, supplies, machinery, equipment, tools, labor, superintendence, insurance, and other accessories and services necessary to complete the said Project in accordance with the Contract Documents is the not to exceed amount of **INSERT AMOUNT Dollars and No Cents** ($xxx,xxx.xx).

The CONTRACTOR hereby agrees to complete all work for the Base Bid by **November 30, 2018,** and for the Bid Option No. 1 by **January 15, 2019** commencing on the date specified in OWNER'S written "Notice to Proceed." Time is of the essence with this contract.

The CONTRACTOR further agrees to comply with applicable statutes governing construction contracts including the provisions of V.T.C.A., Texas Government Code, Title 10, Subtitle F, Chapter 2253 requiring Payment Bonds and Performance Bonds; and to comply with all of the Terms and Conditions of this contract.

Payments by OWNER shall be warrants issued by the Comptroller of Public Accounts out of monies appropriated to the Texas Parks and Wildlife Department for such purpose and shall be made upon OWNER'S acceptance of all portions of work as prescribed in the Specifications.

The dispute resolution process provided for in Tex. Gov't Code, Chapter 2260, and the procedures provided in Title 31, Part 2, Chapter 51, Subchapter J of the Texas Administrative Code shall be used by the Owner and the Contractor to attempt to resolve any claim for breach of contract in an amount less than $250,000.00 made by the Contractor, that is not resolved under procedures described throughout the Terms and Conditions of the Contract. Contract disputes for a claim of $250,000.00 or more shall be governed by Civil Practice and Remedies Code, Chapter 114.

The venue of any suit brought for any breach of this Contract is hereby fixed in any court of competent jurisdiction

in Travis County, Texas. All payments under this Contract shall be due and payable in Travis County, Texas.

The Contractor hereby assigns to Owner any and all claims for overcharges associated with this Contract which arise under the antitrust laws of the United States 15 U.S.C.A. SEC. 1 et. seq. (1973).

This Agreement is subject to cancellation, without penalty, either in whole or in part, if funds are not appropriated by the Texas Legislature or otherwise made available to the Texas Parks and Wildlife Department for the specified services under this Agreement.

The said parties for themselves, their heirs, successors, executors, administrators, and assigns, do hereby agree to full performance of the covenants herein contained.

IN WITNESS WHEREOF, the parties to these presents have executed this Contract in two (2) counterparts, each of which shall be deemed an original, in the day and year first above written.

CONTRACTOR:

By: _____

_____
Title

_____
Date

OWNER: TEXAS PARKS AND WILDLIFE DEPARTMENT

By: _____

_____
Title

_____
Date

TEXAS PARKS AND WILDLIFE

PERFORMANCE BOND

STATE OF TEXAS **Project Number 128696**

COUNTY OF _____ **Contract Number** _____

KNOW ALL MEN BY THESE PRESENTS:

That we, _____, as **PRINCIPAL,**

and _____, as **SURETY(IES),**

Surety Address: _____

Surety Phone: _____ **Surety Fax:**_____

are hereby held and firmly bound unto the State of Texas in the penal sum of:

_____ Dollars ($_____)
for the payment, whereof, the said **PRINCIPAL** and **SURETY(IES)** bind themselves, their heirs, executors, administrators, and successors, jointly and severally, firmly by these presents.

The conditions of this obligation are such that whereas the **PRINCIPAL** entered into a certain contract dated _____, 20___, hereto attached, and made a part hereof, with the State of Texas, acting by and through the Texas Parks and Wildlife Department, to commence and complete certain public works described as:

Flood Repairs, CF Dickinson Marine Laboratory, Dickinson, Galveston County, Texas.

NOW THEREFORE, the conditions of this obligation are such that, if the **PRINCIPAL** shall faithfully perform the contract in accordance with the plans, specifications, and contract documents, and as provided in TITLE 10, TEXAS GOVERNMENT CODE, CHAPTER 2253 shall fully indemnify and save harmless the State of Texas from all cost and damage which the State of Texas may suffer by reason of the **PRINCIPAL'S** default or failure to do so and shall fully reimburse and repay the State of Texas all outlay and expense which the State of Texas may incur in making good any such default, then obligation shall be null and void, otherwise it shall remain in full force and effect.

Provided further, that if any legal action be filed upon this bond, venue shall lie in Travis County, Texas and that the said surety(ies) for value received, hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the Contract, or to the work to be performed thereunder, or the Specifications accompanying the same, shall in anywise affect its obligation on this bond, and it does hereby waive notice of any such change, extension of time, alternation or addition, to the items of the Contract or to the work or to the Specifications.

In the event **PRINCIPAL** is in default under the contract as defined herein, **SURETY(IES)** will within fifteen (15) days of determination of such default take over and assume completion of said contract and become entitled to the payment of the balance of the contract price.

IN WITNESS WHEREOF, the above bound parties have executed this instrument under their several seals this _____ day of _____, 20___, the name and corporation seal of each corporate party being hereto affixed and these presents duly signed by its undersigned representative pursuant to authority of its governing body.

PRINCIPAL **SURETY**

BY_____ BY_____

TEXAS PARKS AND WILDLIFE

PAYMENT BOND

STATE OF TEXAS

COUNTY OF _____

Project Number 128696
Contract Number _____

KNOW ALL MEN BY THESE PRESENTS:

That we, _____, as **PRINCIPAL**,

and _____, as **SURETY(IES),**

Surety Address: _____

Surety Phone: _____ **Surety Fax:**_____

are hereby held and firmly bound unto the State of Texas in the penal sum of:
_____ Dollars ($_____)
for the payment, whereof, the said **PRINCIPAL** and **SURETY(IES)** bind themselves, their heirs, executors, administrators, successors, and assigns jointly and severally, firmly by these presents.

The conditions of this obligation are such that whereas the **PRINCIPAL** entered into a certain contract dated _____, 20__, hereto attached, and made a part hereof, with the State of Texas, acting by and through the Texas Parks and Wildlife Department, to commence and complete certain public works described as:

Flood Repairs, CF Dickinson Marine Laboratory, Dickinson, Galveston County Texas

NOW THEREFORE, the conditions of this obligation are such that, if the PRINCIPAL shall promptly make payment to all claimants as defined in TITLE 10, *TEXAS GOVERNMENT CODE*, CHAPTER 2253, as amended, supplying labor and materials in the prosecution of the work provided for in said contract and any and all duly authorized changes to said contract that may hereafter be made, notice of such changes to the **SURETY(IES)** being hereby waived, then, this obligation shall be null and void, otherwise it shall remain in full force and effect.

This bond is made and entered into solely for the protection of all claimants supplying labor and materials in the prosecution of the work provided for in said contract, and all such claimants shall have a direct right to action under the bond as provided in TITLE 10, *TEXAS GOVERNMENT CODE*, CHAPTER 2253, as amended.

IN WITNESS WHEREOF, the above bound parties have executed this instrument under their several seals this _____ day of _____, 20__, the name and corporation seal of each corporate party being hereto affixed and these presents duly signed by its undersigned representative pursuant to authority of its governing body.

PRINCIPAL

BY_____

SURETY

BY_____

TEXAS PARKS AND WILDLIFE

CONTRACTOR'S PROGRESS PAYMENT AFFIDAVIT

STATE OF TEXAS

COUNTY OF _____

PROJECT NUMBER 128696

CONTRACT NUMBER _____

BEFORE ME THE UNDERSIGNED AUTHORITY, on this day personally appeared

_____ who being duly sworn, on oath, says that he/she is a duly authorized representative of

_____ , CONTRACTOR, and all terms of the Contract for the completion of certain public works described as **Project No. 128696 – Flood Repairs, CF Dickinson Marine Laboratory, Galveston County, Texas** have been satisfactorily completed to the extent indicated on the attached voucher and that ALL sums of money due for payrolls, bills for material and equipment, and other indebtedness connected with the Work for which OWNER or its property might in any way be responsible, to the best of his/her knowledge and belief have been paid or will be paid or otherwise satisfied within ten days after receipt of the requested payment from the OWNER, or within the period of time required by Title 10, Texas Government Code, Section 2251.022.

Affiant agrees to indemnify and hold Owner harmless from any liens, debts or obligations which arise as a result of labor or materials provided by or through Affiant to the project. Affiant further agrees to indemnify and hold harmless all real property on which the improvements were constructed and all interests in such property, including leasehold interests, from any liens, debts, or obligations arising from any labor or materials provided by or through Affiant to the project.

Payments to subcontractors for labor and/or materials which are pending or disputed as of the date hereof are:

Individual or Company Name	Mailing Address	Amount Owed

Instructions: Affidavit must be signed by an individual owner, a partner in a partnership, or by a person authorized by bylaws or Board of Directors to sign for a corporation. If Contractor is a joint venture or partnership of individuals, either may sign, but if a joint venture in which a corporation is a party, separate affidavits must be executed by each corporation and by each individual owner or partnership.

_____
Signature

_____
Title

Sworn to and subscribed before me this _____ day of _____ 20__.

(SEAL)

_____
Notary Public in and for
_____ County, Texas

TEXAS PARKS AND WILDLIFE

CONTRACTOR'S FINAL PAYMENT AFFIDAVIT

STATE OF TEXAS

PROJECT NUMBER 128696

COUNTY OF _____

CONTRACT NUMBER _____

BEFORE ME THE UNDERSIGNED AUTHORITY, on this day personally appeared

_____

who being duly sworn, on oath, says that he/she is a duly authorized representative of

_____ , CONTRACTOR,

and that all terms of the Contract for the completion of certain public works described as **Project No. 128696 – Flood Repairs, CF Dickinson Marine Laboratory, Galveston County, Texas** have been satisfactorily completed and that ALL sums of money for payrolls, bills for material and equipment, and other indebtedness connected with the Work for which Owner or its property might in any way be responsible, to the best of his/her knowledge and belief, have been paid or will be paid or otherwise satisfied within ten days after receipt of final payment from the Owner, or within the period of time required by Title 10, Texas Government Code, Section 2251.022. Payments not made in full at the date of this affidavit are listed below.

Affiant hereby waives all claims against the Owner. (List any exceptions):

_____

Affiant agrees to indemnify and hold Owner harmless from any liens, debts or obligations which arise as a result of labor or materials provided by or through Affiant to the project. Affiant further agrees to indemnify and hold harmless all real property on which the improvements were constructed and all interests in such property, including leasehold interests, from any liens, debts, or obligations arising from any labor or materials provided by or through Affiant to the project.

Final payments to subcontractors for labor and/or materials which are pending or disputed as of the date hereof are:

Individual or Company Name	Mailing Address	Amount Owed

INSTRUCTIONS: Affidavit must be signed by an individual owner, or partner in a partnership, or by a person authorized by bylaws or Board of Directors to sign for a corporation. If Contractor is a joint venture or partnership of individuals, either may sign, but if a joint venture in which a corporation is a party, separate affidavits must be executed by each corporation and by each individual owner or partnership. In the event subcontractors, laborers, or materialmen have not been paid in full, Contractor shall list hereon the amount owed and the name and address of each subcontractor, laborer, or materialman to whom such payment is owed. Add additional pages if required.

_____
Signature

_____
Title

Sworn to and subscribed before me this _____ day of _____ 20__
.

(SEAL)

_____
Notary Public in and for
_____ County, Texas

TEXAS PARKS AND WILDLIFE

CONSENT OF SURETY COMPANY TO FINAL PAYMENT

PROJECT NO. **128696** **CONTRACT NO.** _____

TITLE OF PROJECT **Flood Repairs**

PROJECT LOCATION **CF Dickinson Marine Laboratory** **CONTRACT DATE** _____

OWNER: Texas Parks and Wildlife Department
4200 Smith School Road
Austin, Texas 78744

CONTRACTOR: _____
(Name)
_____
(Address)
_____
(City, State, Zip Code)

SURETY COMPANY: _____
(Name)
_____
(Address)
_____
(City, State, Zip Code)

on bond of _____, Contractor, hereby approves of the final payment by Owner to Contractor on the above Contract, and agrees that final payment to the Contractor shall not relieve Surety Company of any of its obligations to Owner as set forth in said Surety Company's bond.

IN WITNESS WHEREOF, Surety Company has hereunto set its hand this _____ day of _____, 20__.

SURETY COMPANY:

By: _____
(Signature)
_____
(Printed Name)
_____
(Title)

NON-USE OF ASBESTOS CONTAINING MATERIALS AFFIDAVIT - CONTRACTOR

STATE OF TEXAS §
§
COUNTY OF _____ §

Project Name: CF Dickinson Marine Laboratory- Flood Repairs

Project Number: 128696

By the signature below, the signatory for the Contractor certifies that neither he nor the firm, corporation, partnership or institution represented by the signatory or anyone acting for the firm providing Construction Services for this project, including Subcontractors, have utilized materials, procedures or processes that knowingly or intentionally contain asbestos materials.

Signature: _____

Printed Name: _____

Title: _____

Company: _____

Date: _____

State of Texas
County of _____

Sworn to and subscribed before me on the _____ day of _____, 20___ by _____ (name/signature of signer) the undersigned authority on behalf of said Contractor.

(Personalized Seal)

_____
Notary Public's Signature

My commission expires: _____

CONSTRUCTION DOCUMENTS

DIVISION 1 – GENERAL REQUIREMENTS

SECTION 01000 – SPECIAL CONDITIONS

PART 1 – GENERAL

1.01 RELATED DOCUMENTS:

Drawings and general provisions of Contract, including Uniform General and Supplementary General Conditions and other Division 1 specification sections, apply to work of this section.

1.02 DESCRIPTION OF WORK:

Furnish all labor, materials, tools, equipment and incidentals necessary for performance of all work associated with **Project Number 128696, Flood Repairs, CF Dickinson Marine Laboratory, Galveston County, Texas,** such work being as more particularly described in these Special Conditions, the drawings, and elsewhere in these Bidding and Contract Documents.

1.03 INQUIRIES:

All inquiries regarding the Bidding and Contract Documents, including any apparent discrepancies thereto and administration of the contract, shall be directed to the Texas Parks and Wildlife Department, Infrastructure Division, 4200 Smith School Road, Austin, Texas 78744, Cruz Banda**,** Contract Manager, 512/**389-8761**.

1.04 EXAMINATION OF SITE:

Bidders should visit the site and be thoroughly familiar with job conditions such as the location, accessibility, and general character of the site and/or building prior to submitting a bid. Visits shall be scheduled with Roger Padon, Construction Manager, 512-627-4417. Failure to give proper consideration to site conditions when preparing bids will not constitute grounds for additional compensation. **(See UGC, Article 3).**

1.05 INTENT OF THE CONTRACT DOCUMENTS: **(See also UGC, Article 6)**

A. The intent of the Contract Documents is to include all of the work for the contract price and within the contract time. Contract Documents are to be considered as cooperative. All work not specified and/or not shown on the drawings but which is necessary for the completion and/or functioning and operation of the project, shall be understood and implied as part of the contract to be performed by the Contractor for the contract price. Such work shall be executed by the Contractor in the same manner and with the same character of material as other portions of the contract without extra compensation.

B. It is the intention of the Contract Documents to call for finished work, tested, and ready for operation.

1. Any apparatus, material or work described in the Contract Documents and any incidental accessories necessary to make the work complete in all respects and ready for operation

(even though not particularly specified) shall be furnished, delivered, and installed by the Contractor without additional expense to the Owner.

2. Minor details not usually shown or specified but necessary for proper installation and operation are included in the work just as if herein specified or shown.

C. All work shall be performed and furnished by the Contractor in accordance with accepted construction industry practices.

D. A duplication of work is not intended by the Contract Documents and any duplication shall not become a basis for extra cost to the Owner.

E. Explanatory notes on the drawings shall take precedence over conflicting drawn-out indications. Figured dimensions on drawings shall take precedence over scale measurements. Where figures are lacking, scale measurements may be followed, but in all cases the measurements are to be checked from the work in place and those measured dimensions taken at the site shall take precedence over scale dimensions in drawings.

F. Upon discovery by Contractor of errors, omissions or inconsistencies in the Contract Documents, Contractor shall promptly report them to the Owner and shall wait for instruction from Owner prior to proceeding with the work.

G. In the event of conflict between the Special Conditions, the Supplementary Conditions, and the Uniform General Conditions, the following priority order shall apply in resolving such conflicts: Special Conditions, Supplementary Conditions, and then Uniform General Conditions.

H. The drawings consist of all project drawings and any drawings issued by addenda.

1.06 ADDENDA:

Any addenda issued in writing by the Owner during the period of bidding shall be included in the bid and Bidder's receipt of addenda shall be acknowledged in the bid form. Such addenda shall become a part of the contract and shall modify the Contract Documents accordingly. Oral changes in the work made during the period of bidding will not be binding. **BIDDER'S FAILURE TO ACKNOWLEDGE RECEIPT OF ADDENDA MAY RESULT IN REJECTION OF BID.**

1.07 PERMITS AND LAWS **(See also UGC Article 3):**

Contractor shall comply with all laws, ordinances, statutes, rules and regulations applicable to the project, including but not limited to those pertaining to the collection, transportation and disposal of trash and refuse and shall obtain such permits, licenses or other authorizations as may be required.

If applicable governmental laws, rules, regulations or ordinances conflict with the Contract Documents, then such laws, rules, regulations, or ordinances shall govern instead of the Contract Documents, except in such cases where the Contract Documents exceed them in quality of materials or labor, then the Contract Documents shall be followed.

1.08 PRECONSTRUCTION CONFERENCE AND PROGRESS MEETINGS: **(See also UGC Article 3)**

After issuance of the Notice to Proceed letter and prior to start of work, a conference between the Owner and the Contractor will be held to discuss provisions of the Contract Documents and to coordinate the work effort. Attendance by Contractor and Contractor's superintendent(s) is required, along with major

trades if requested by Owner. Construction progress meetings may be called at any time by the Owner's Project Manager, On-Site ODR, or the Contractor to review job progress or problems.

1.09 SUBMITTALS:

A. GENERAL **(See also UGC Article 8):**

1. A TPWD standard *Submittal Cover Sheet* must accompany each numbered submittal set. **One Submittal per *Submittal Cover Sheet***.
2. The number of copies of submittals required for each item shall be not less than one (1) electronic copy, unless specified otherwise, for Owner's use, plus the number of additional copies that the Contractor desires for his own use.
3. The Contractor must double-check and sign all submittals before forwarding them to the Owner for review and action.
4. The Architect/Engineer and the Owner will review the submittal data. If there are no exceptions taken to the submittal, the original and three copies will be retained by the Owner. All remaining copies will be returned to the Contractor. The Contractor must keep one copy at the jobsite at all times.
5. If further action is required by the Contractor, Owner will retain three copies of the submittal data for the Owner's use and return all remaining copies to the Contractor.
6. Any and all costs, direct or indirect, incurred by Owner in reviewing submittals in excess of two (2) times will be charged to the Contractor and deducted from the total price for the work.
7. Owner's approval of shop drawings and/or any aspects of the work shall not act to transfer Contractor's responsibility for, nor relieve Contractor from the performance of any of Contractor's duties set forth in the contract documents.

B. PRE-CONSTRUCTION SUBMITTALS: The following Pre-construction Submittals shall be submitted by the Contractor for the Owner's review and approval. Owner will provide more specific clarification regarding the requirements for each PR Submittal.

1. Submittal PR-1 – **To be submitted to Owner no later than twenty-one (21) days after issuance of the Notice to Proceed but prior to the Pre-Construction Conference**: (**See also UGC Article 3)**

    a. Contractor's Superintendent: List of name and qualifications of the person designated as project superintendent.
    b. Subcontractors/Materials Suppliers: List of all subcontractors and major material/equipment suppliers that Contractor and Contractor's major subcontractors propose to use. This list shall include correct names, mailing addresses and phone numbers.
    c. Contractor's Authorized Representatives: List of names and titles of Contractor's representatives authorized to sign contractual documents and construction vouchers**.**
    d. Licensed Craftspersons: List of names, qualifications and licenses of all licensed crafts required by the contract documents.

2. Submittal PR-2 – **To be submitted to Owner no later than twenty-one (21) days after issuance of the Notice to Proceed**:

a. Schedule of Values, itemizing material and labor for each classification of work. **(See also UGC, Article 10)**

1. Owner will provide forms entitled "*Schedule of Values*" for the Contractor's use in preparing the breakdown. After contract award, the Owner will also provide further clarification including an example.

2. Itemization of material and labor costs is required so the Owner may make progress payments on materials delivered. For each bid item or classification of work to be listed in the "Type of Work" column on the *Schedule of Values*, the Contractor shall multiply the unit bid price by the estimated quantity for each bid item to arrive at the "Contract Cost" for each such bid item. Contractor shall separately itemize material and labor costs for each such bid item in the "Type of Work" column.

b. Work Progress Schedule (in duplicate) of *Contractor's Proposed Construction Schedule* for work tasks in relation to the entire project. **(See also UGC, Article 9)** Owner will provide a schedule bar chart form to aid the Contractor in preparing a schedule. The Contractor shall follow this format and must indicate all work tasks as well as differentiate critical path work tasks from non-critical path tasks showing the beginning and ending dates for each critical and non-critical path work task.

c. Submittal Register: Submittal Register shall be organized by specification section, listing all items to be furnished for review and approval by the A/E and the Owner, including anticipated sequence and submittal dates. (Refer to Article 8, specifically 8.3.1.3, of the Uniform General Conditions.)

C. MATERIAL SUBMITTALS: **To be submitted to Owner prior to the installation of any materials. It is the Contractor's responsibility to incorporate lead time required for review, resubmittal, ordering, manufacturing, fabrication and delivery. Contractor is responsible if a delay in lead time planning affects the critical path.**

1. Contractor shall submit manufacturer's information on all materials and equipment, regardless of whether substitutions are being requested.

2. Substitution requests must be submitted early enough to allow time for evaluation by the Owner and for re-submittal, if required. Contractor's substitution requests shall address the following factors which will be considered in evaluating the proposed substitution:

a. Whether the evaluation and acceptance of the proposed substitution will prejudice the Contractor's achievement of Substantial Completion on time;

b. Whether acceptance of the substitution for use in the work will require a change in any of the Contract Documents to adapt the design to the proposed substitution.

c. Whether incorporation or use of the substitution in connection with the work is subject to payment of any license fee or royalty.

d. Whether all variations of the proposed substitution from the items originally specified are identified.

e. Whether available maintenance, repair, and replacement service are indicated. The manufacturer shall have a local service agency (within 50 miles of the site) which maintains properly trained personnel and adequate spare parts and is able to respond and complete repairs within 24 hours.

f. Whether an itemized estimate is included of all costs that will result directly or indirectly from acceptance of such substitution, including cost of redesign and claims of other contractors affected by the resulting change.

g. Whether the proposed substitute item meets or exceeds the experience and/or equivalency requirements listed in the appropriate technical specifications.

3. No materials shall be ordered or installed until submittals for such materials have been received and acted upon by the Owner.

1.10 QUALITY ASSURANCE **(See also UGC Article 8):**

A. The Owner's On-Site ODR will periodically inspect and observe the construction progress, procedures, and materials of the Contractor. The Contractor shall coordinate all efforts with the On-Site ODR, offer full cooperation to facilitate such observations, and shall be responsive to questions from such On-Site ODR regarding methods, equipment, materials, and intentions in pursuing the work or any particular thereof. Such observation by the Owner shall not be construed as construction supervision nor indication of approval of the manner or location in which the work is being performed as being a safe practice or place.

B. The On-Site ODR's responsibilities include but are not limited to:

1. Providing quality assurance for the Owner.
2. Submitting written reports concerning the current status of the work.
3. Reviewing, and verifying to the Owner the amounts shown on the Contractor's monthly *Construction Voucher*.
4. Requesting and receiving payroll and materials invoice amounts from the Contractor.
5. Witnessing testing and confirming in writing to the Owner the results of all tests.

C. Inspections, Notification, and Scheduling:

1. The Contractor shall notify the On-Site ODR when work is ready for inspection or testing. The Contractor shall give such notifications sufficiently in advance of other work to prevent delays. A minimum of five (5) working days advance notice is required, and Contractor shall include in his work schedule such notice periods for inspections and/or testing.
2. Tests cannot be conducted and work cannot be covered-up until the On-Site ODR observes and authorizes continuation of work. The Contractor shall bear all costs for re-tests and for removal and replacement of construction resulting from unauthorized continuation.
3. Should ODR fail to make the necessary inspection within the agreed period, Contractor may proceed with cover-up Work after making every reasonable effort to contact the ODR and after documenting the Work, but is not relieved of responsibility for Work to comply with requirements of the Contract Documents.

D. All permanent utilities shall be connected before final tests are conducted for equipment and systems. Final operational tests shall be conducted prior to project acceptance by the Owner. The

Contractor shall provide the materials, energy, equipment and personnel to conduct the tests required in the contract.

E. Contractor's failure to provide notification to Owner of inspection or testing requirements shall void any certifications of testing and shall require the Contractor to re-test at the Owner's request. All expenses for re-testing shall be paid by the Contractor.

F. The Owner (including Owner's On-Site ODR) may reject work not conforming to the contract documents. If the Owner rejects work and/or materials incorporated into the project, Contractor shall bear all expenses associated with testing to prove compliance with the Contract Documents, including but not limited to engineering/architectural expenses associated with such testing. Any and all such expenses that are paid directly by Owner shall be deducted or withheld from subsequent payment(s) to the Contractor.

1.11 INVOICES/PAY REQUESTS AND CHANGE ORDERS:

A. All work items for which Contractor requests payment shall reflect the project number with which those work items are associated. **Change Order pricing for items that are already priced in the contractor's bid shall be limited to such price(s) set forth in such bid and shall not be entitled to additional mark-up for overhead and profit.**

B. Contractor is required to submit an **original** Progress Assessment Report (PAR) to TPWD HUB Administration no later than the 5th day of the month. Contractor shall submit a **copy** of the current month's PAR to the Owner with the application for payment (construction voucher). The PAR is the monthly compliance report verifying Contractor's compliance with the HUB Subcontracting Plan (HSP) including the expenditures the Contractor has made to Subcontractors during the prior month.

1.12 CONTRACT COMPLETION: **(See also UGC, Article 9)**

A. Contract Period: This contract must be completed within the specified number of days commencing on the date cited in the Notice to Proceed letter.

1. Unless specifically stated as "working day," the term "day" or "calendar day" shall mean every day of the calendar year. Along with the Work Progress Schedule, the Contractor shall submit his schedule for normal working days.
2. Claims for extension of time shall be made in accordance with the provisions of Article 9 of the Uniform General Conditions.

B. **Liquidated Damages:** The Owner has determined that the completion of the work in this contract is critical to the proper operation of the facility, and the Contractor's failure to complete the work within such time will cause damage to the Owner. Since exact damages are difficult to determine or forecast, the sum of **$339.22** per calendar day is hereby established by the parties as a reasonable estimate of just compensation to the Owner for the failure of the Contractor to complete the work by the time set forth in the contract or authorized extension thereto. Said sum will be deducted from the money due or to become due to the Contractor, not as a penalty but as liquidated damages from added expense, including administrative and inspection costs, for each and every calendar day the work or any portion thereof remains incomplete after the expiration of the time limit set in the contract or authorized extension.

C. Charges for liquidated damages will begin accumulating on the first calendar day following the final contract completion date and continue until the date of final acceptance as established by the Owner. Final acceptance will not be issued until all punch list items have been completed.

1.13 CONTRACT CLOSE-OUT: (**See also UGC Article 12)**

A. Notification: The Contractor shall provide Owner 15-days' written notice requesting final inspection.

B. Final Submittals**:** At the time of the Contractor's request for final inspection, Contractor shall provide to Owner the following material (in addition to final payment documents also required by UGC Article 12 and set forth below in subsection D) which the Contractor shall have accumulated and retained during the course of the project:

1. One (1) hard copy and one (1) electronic set of all project submittals and all equipment and material warranties/guarantees as provided by all appropriate suppliers or manufacturers.
2. One set of "as-built documents" showing all revisions to the original Contract Documents. Drawings shall also show routing of underground outside utilities and conduits with actual dimensions from buildings or other known landmarks.
3. Any and all other documents, keys, manuals, etc. required by the Contract Documents.

C. Clean-up: At completion of the job, the Contractor shall remove all waste products, dust, dirt, debris, packaging, trash, fingerprints, grease containers, and other deleterious materials and marks from the site. Refer to individual specification sections for special cleaning required by that section. Contractor is expected to leave the project in spotless, "like new" condition.

D. Final Payment: Submit final construction voucher, *Consent of Surety Company to Final Payment*, and the *Contractor's Final Payment Affidavit*.

1.14 CONTRACTOR'S RESPONSIBILITY DURING THE WARRANTY PERIOD **(See also UGC, Article 13)**:

A. Warranties: The Contractor shall guarantee all work against defects in materials, equipment, or workmanship for a period of one year from the date of final acceptance. The Contractor shall also provide any additional warranties and guarantees of work items and components as hereinafter specified.

B. Service: All necessary service to each electrical and mechanical system and other work requiring specialized training shall be furnished by the Contractor at no cost to the Owner for a period running concurrently with the one year warranty period specified above. Such service shall not include repair of damage due to storm, vandalism or other factors entirely beyond the control of the Contractor.

C. The Contractor will receive no additional compensation for work performed during the one-year warranty period.

1.15. REFERENCES AND STANDARDS:

All contractors, including sub-contractors shall ensure all personnel follow the adopted Standardized Building Codes in all design and construction work.

1.16 NON-APPROPRIATION OF FUNDS:

Any contract resulting from this solicitation is subject to termination or cancellation, without penalty to TPWD, either in whole or in part, subject to the availability of state funds. TPWD is a state agency whose authority and appropriations are subject to actions of the Texas Legislature. If TPWD becomes subject to a legislative change, revocation of statutory authority, or lack of appropriated funds which would render TPWD's or contractor's delivery or performance under the contract impossible or unnecessary, the contract will be terminated or cancelled and be deemed null and void. In the event of a termination or cancellation under this Section, TPWD will not be liable to contractor for any damages, which are caused or associated with such termination, or cancellation and TPWD will not be required to give prior notice.

1.17 ANTIQUITIES:

Contractor shall take precaution to avoid disturbing primitive records and antiquities of archaeological, paleontological or historical significance. No objects of this nature shall be disturbed without written permission of Owner and the Texas Historical Commission. When such objects are uncovered unexpectedly, the Contractor shall stop all Work in close proximity and notify the ODR and the Texas Historical Commission of their presence and shall not disturb them until written permission and permit to do so is granted. All primitive rights and antiquities, as defined in Chapter 191, Texas Natural Resource Code, discovered on the Owner's property shall remain property of State of Texas, the Texas Historical Commission. It is determined by Owner, in consultation with the Texas Historical Commission that exploration or excavation of primitive records or antiquities on Project Site is necessary to avoid loss, Contractor shall cooperate in salvage work attendant to preservation.

1.18 PROPRIETARY OR CONFIDENTIAL INFORMATION; TEXAS PUBLIC INFORMATION ACT:

A. Any proprietary, trade secret or otherwise confidential information Bidder includes in its Bid must be clearly labeled as proprietary or confidential information, and Bidder must identify the specific exception to disclosure in the Public Information Act (PIA). Merely making a blanket claim the entire Bid is protected from disclosure because it contains some proprietary information is not acceptable and shall make the entire Bid subject to release under the PIA. In order for the Owner to initial the process of seeking an Attorney General opinion on the release of proprietary or confidential information, the specific provisions of the Bid that are considered by the Bidder to be proprietary or confidential must be clearly labeled as described herein. Any information which is not clearly identified as proprietary or confidential shall be deemed to be subject to disclosure pursuant to the PIA.
B. Information the Bidder provides to the Owner in response to this solicitation will be considered public and subject to disclosure under the Texas Public Information Act.
C. Contractor is required to make any information created or exchanged with the state pursuant to this contract, and not otherwise excepted from disclosure under the Texas Public Information Act, available in a format that is accessible by the public at no charge to the state. Contractor will make sure information not excepted from disclosure available in an electronic format that is accessible to the public unless Contractor receives written approval from Owner to provide information in a different format, and such approval becomes a part of this Contract.

1.19 RIGHT TO AUDIT/RECORDS RETENTION:

Contractor understands that acceptance of funds under this contract acts as acceptance of the authority of the State Auditor's Office, TPWD or any successor agency, to conduct an audit or investigation in connection with those funds. Contractor further agrees to cooperate fully with the above parties in the conduct of the audit or investigation, including providing all records requested. Contractor shall ensure that this paragraph concerning the State's authority to audit funds received indirectly by subcontractors through Contractor and the requirement to cooperate is included in any subcontract it awards. Contractor shall maintain and retain supporting fiscal and any other documents relevant to showing that any payments under this Contract funds were expended in accordance with the laws and regulations of the State of Texas, including but not limited to, requirements of the Comptroller of the State of Texas and the State Auditor. Contractor shall maintain all such documents and other records relating to this Contract and the State's property for a period of seven (7) years after the date of submission of the final invoices or until a resolution of all billing questions, whichever is later. Contractor shall make available at reasonable times and upon reasonable notice, and for reasonable periods, all documents and other information related to the work of this Contract. Contractor and the subcontractors shall provide the State Auditor with any information that the State Auditor deems relevant to any investigation or audit. Contractor must retain all work and other supporting documents pertaining to this Contract, for purposes of inspecting, monitoring, auditing, or evaluating by TPWD and any authorized agency of the State of Texas, including an investigation or audit by the State Auditor. Contractor shall cooperate with any authorized agents of the State of Texas and shall provide them with prompt access to all of such State's work as requested. Contractor's failure to comply with this Section shall constitute a material breach of this Contract and shall authorize TPWD and the State of Texas to immediately assess appropriate damages for such failure.

1.20 IMMIGRATION REFORM:

The Contractor represents and warrants that it shall comply with the requirements of the Immigration Reform and Control Act of 1986 and 1990 regarding employment verification and retention of verification forms for any individuals hired on or after November 6, 1986, who will perform any labor or services under the Contract and the Illegal Immigration Reform and Immigrant Responsibility Act of 1996 (IIRIRA) enacted on September 30, 1996.

1.21 CIVIL RIGHTS:

The Contractor agrees that no person shall, on the ground of race, color, religion, sex, national origin, age, disability, political affiliation, or religious belief, be excluded from the participation in, be denied the benefits of, be subjected to discrimination under, or be denied employment in the administration of, or in connection with, any program or activity funded in whole or in part with funds available under this Contract. The Contract shall comply with Executive Order 11246, "Equal Employment Opportunity," as amended by Executive Order 11375, "Amending Executive Order 11246 relating to Equal Employment Opportunity," and as supplemented by regulations at 41 C.F.R. Part 60, "Office of Federal Contract Compliance Programs, Equal Employment Opportunity Department of Labor."

1.22 FEDERAL, STATE AND LOCAL REQUIREMENTS:

Contractor shall demonstrate on-site compliance with the Federal Tax Reform Act of 1986, Section 1706, amending Section 530 of the Revenue Act of 1978, dealing with issuance of Form W-2's to common law employees. Contractor is responsible for both federal and State unemployment insurance coverage and standard Worker's Compensation insurance coverage. Contractor shall comply with all federal and State tax laws and withholding requirements. The State of Texas shall not be liable to Contractor or its employees for any Unemployment or Worker's Compensation coverage or federal or State withholding

requirements. **Contractor shall indemnify the State of Texas and shall pay all costs, penalties or losses resulting from Contractor's omission or breach of this Section.**

1.23 SEVERABILITY CLAUSE:

If any provision of this Contract is construed to be illegal or invalid, such construction will not affect the legality or validity of any of its other provisions. The illegal or invalid provision will be deemed severable and stricken from the contract as if it had never been incorporated herein, but all other provisions will remain in full force and effect.

1.24 NO WAIVER:

Nothing in this Contract shall be construed as a waiver of the state's sovereign immunity. This Contract shall not constitute or be construed as a waiver of any of the privileges, rights, defenses, remedies or immunities available to the State of Texas. The failure to enforce or any delay in the enforcement of any privileges, rights, defenses, remedies or immunities available to the State of Texas under this Contract or under applicable law shall not constitute a waiver of such privileges, rights, defenses, remedies or immunities or be considered as a basis for estoppel. The Owner does not waive any privileges, rights, defenses or immunities available to the Owner by entering into this Contract or by its conduct prior to or subsequent to entering into this Contract.

1.25 DECEPTIVE TRADE PRACTICES; UNFAIR BUSINESS PRACTICES:

Contractor represents and warrants that it has not been the subject of allegations of Deceptive Trade Practices violations under Tex. Bus. & Com Code, Chapter 17 or allegations of any unfair business practice in any administrative hearing or court suit and that Contractor has not been found to be liable for such practices in such proceedings. Contractor certifies that it has no officers who have served as officers of other entities who have been the subject allegations of Deceptive Trade Practices violations or allegations of any unfair business practices in an administrative hearing or court suit, and that such officers have not been found to be liable for such practices in such proceedings.

1.26 FELONY CRIMINAL CONVICTIONS:

Contractor represents and warrants that Contractor has not and Contractor's employees have not been convicted of a felony criminal offense or that if such a conviction has occurred, Contractor has fully advised the Owner as to the facts and circumstances surrounding the conviction.

1.27 ASSIGNMENTS:

The Contractor shall not assign its rights under the Contract or delegate the performance of its duties under the Contract without prior written approval from the Owner.

1.28 INDEPENDENT CONTRACTOR:

The Contractor shall not render the Contractor to an employee, officer or agent of the Owner for any purpose. The Contractor is and shall remain an independent contractor in relationship to the Owner. The Owner shall not be responsible for withholding taxes from payments made under the Contract. The Contractor shall have no claim against the Owner for vacation pay, sick leave, retirement benefits, social security, worker's compensation, health or disability benefits, unemployment insurance benefits, or employee benefits of any kind.

1.29 PATENTS, TRADEMARKS OR COPYRIGHTS:

Contract agrees to defend and indemnify the Owner and State from claims involving infringement or violation of patents, trademarks, copyrights, trade secrets, or other proprietary rights, arising out of the Owner's or the State's use of any good or service provided by the Contractor as a result of this solicitation.

1.30 FORCE MAJEURE:

The Owner may grant relief from performance of contract if the Contractor is prevented from performance by an act of war, order of legal authority, act of God, or other unavoidable cause not attributable to the fault or negligence of Contractor. The burden of proof for the need of such relief shall rest upon the Contractor. To obtain release based on force majeure, the Contractor shall file a written request with the Owner.

1.31 U.S. DEPARTMENT OF HOMELAND SECURITY'S E-VERIFY SYSTEM:

By entering into this Contract, the Contractor certifies and ensures that it utilizes and will continue to utilize, for the term of this Contract, the U.S. Department of Homeland Security's E-Verify system to determine the eligibility of:

A. All persons employed to perform duties within Texas, during the term of the Contract; and
B. All persons (including subcontractors) assigned by the Respondent to perform work pursuant to the Contract, within the United States of America.

The Contractor shall provide, upon request of Texas Parks and Wildlife Department, an electronic or hardcopy screenshot of the confirmation or tentative non-confirmation screen containing the E-Verify case verification number for attachment to the Form I-9 for the three most recent hires that match the criteria above, by the Contractor, and Contractor's subcontractors, as proof that this provision is being followed.

If this certification is falsely made, the Contract may be immediately terminated, at the discretion of the state and at no fault to the state, with no prior notification. The Contractor shall also be responsible for the costs of any re-solicitation that the state must undertake to replace the terminated Contract.

1.33 MINIMUM EXPERIENCE REQUIREMENTS:

CONTRACTOR MUST SHOW EVIDENCE OF THREE (3) SUCCESSFUL CONSTRUCTION PROJECTS SIMILAR TO THIS PROJECT (AS JUDGED BY OWNER) TO BE ELIGIBLE FOR AWARD OF THIS CONTRACT. THIS EXPERIENCE MUST HAVE OCCURRED WITHIN THE PAST (_5_) YEARS, MEASURED BACKWARDS FROM THE ISSUE DATE OF THIS SOLICITATION.

REQUIRED LICENSING: PLUMBERS, ELECTRICIANS, & HAZMAT REMEDIATION, IF APPLICABLE.

PART 2 – PRODUCTS

2.01 CONSTRUCTION MATERIALS:

A. Materials:

1. All materials shall be new and of the quality specified. Materials shall be free from defects. Where manufacturer's names are mentioned in the specifications, it has been done in order to establish a standard of quality and construction, not to preclude the use of equal or superior materials or products of other manufacturers. However, substitutions must have Owner's prior approval.
2. Unless otherwise indicated in the specifications or drawings, equipment and material shall be installed in accordance with the manufacturer's recommendations and shall include such tests as manufacturer recommends.

B. Storage and Protection of Materials:

1. All materials shall be suitably stored to be protected from damage. Water-tight storage facilities of suitable size with floors raised above the ground shall be provided for all materials subject to damage from exposure to the weather. Other materials shall be stored on blocks off the ground. Materials shall be stored to permit easy access for inspection and identification. Any material which has deteriorated, become damaged or otherwise unfit for use shall not be used in the work (as judged by Owner). Upon completion of all work, or when directed, the Contractor shall remove storage facilities from the site.
2. During construction, open ends of all drains, piping and conduit, and all openings in equipment, shall be closed before leaving the work at any time so as to prevent the entrance of all foreign matter.

PART 3 – EXECUTION

3.01 CONSTRUCTION SITE AND JOB CONDITIONS:

A. The Contractor's Superintendent shall be on site at all times that work is in progress.

B. The Contractor will be provided with designated space in the immediate vicinity of the job site for his use during construction. Unauthorized damage to any existing utilities, building facilities, structures, or plant life shall be repaired by the Contractor at no expense to the Owner. The Contractor shall not allow any unsafe or unsanitary conditions to develop as a result of Contractor's operations.

C. The Contractor shall not allow trash or debris to accumulate on the site. At the end of the contract Contractor shall clean the entire area of any litter resulting from Contractor's operations. The Contractor shall maintain the premises as clean and presentable as good construction practices will allow at all times.

D. Utilities: Water and electrical power **are** available and **will** be furnished by the Owner at no charge to the Contractor. However, any temporary connections, appurtenances or extensions shall be provided by the Contractor at no cost to the Owner and removed from the premises at the conclusion of the contract. Contractor shall provide cellular telephone service at all times and shall keep Owner informed of telephone number.

E. Field Office: The Owner will provide the Contractor with a site on which the Contractor may place a small, temporary office structure.

F. Temporary Toilets: The Contractor shall provide and maintain in neat, sanitary condition toilets and other necessary accommodations for employees' use to comply with the regulations of the State Department of Health or other jurisdictions.

G. Project Identification: There shall be no project signs of any size or type allowed on the project site or surrounding Texas Parks and Wildlife Department property at any time.

H. Fire Protection: The Contractor shall take stringent precautions against fire. Open fires are not allowed unless approved in writing by Owner.

3.02 OCCUPATIONAL SAFETY AND HEALTH STANDARDS **(See also UGC Article 7):**

Prior to trenching below a depth of four (4) feet (if applicable), a Contractor must submit separate pay items for: (i) trench safety to be determined by the linear feet of trench excavated, and (ii) special shoring requirements, if any, to be determined by the square feet of shoring used, pursuant to Texas Government Code, Title 10, Chapter 2166, Section 2166.303. Such pay item(s), following calculation as required above, shall be quoted on the basis of a total lump sum price.

3.03 LAYOUT OF WORK AND SURVEYS:

The Contractor, at Contractor's expense, shall be responsible for establishing base lines, and bench marks if applicable, for the limits of the project. The Contractor shall also be responsible for all measurements that may be required for the execution of the work to the location and limit marks prescribed in the specifications or on the drawings, subject to such modifications as the Owner may require to meet changed conditions or as a result of necessary modifications to the work.

3.04 SITE OPERATIONS:

During construction of this project the facility will remain closed to public visitation. It is the responsibility of the Contractor to maintain convenient access and egress to park facilities in a manner to be approved by the Owner. The Contractor shall also be responsible for public safety at the construction site. All temporary fencing, barricades, warning lights, signs, and flagmen shall be provided and maintained by Contractor as needed. The Contractor shall maintain security of construction sites.

3.05 CUTTING AND PATCHING:

A. Where indicated in the Contract Documents, this project requires cutting into existing construction for the performance of the work and requires subsequent fitting and patching to restore the existing work to original condition.

B. Utilities:

1. Contractor shall not cut or patch utilities until all necessary approvals and coordination requirements are accomplished.
2. Before cutting services that are to remain permanently or temporarily in service, Contractor shall provide by-pass system as necessary to maintain service.
3. After by-pass and cutting, Contractor shall cap, valve or plug and tightly seal remaining portion of service piping or conduit to prevent entrance of moisture and foreign matter.

C. Structural Work: Contractor shall not cut or patch structural work in a manner that would result in a reduction of load-carrying capacity or of load-deflection ratio.

D. Inspection:

1. Before cutting, Contractor shall examine items to be cut and patched and the conditions under which the work is to be performed. If unsafe or otherwise unsatisfactory conditions are encountered, Contractor shall take corrective action before proceeding with the work.
2. Contractor shall meet at the work site with all trades involved in cutting and patching. Contractor shall review areas of potential interference and conflict between the various trades and shall coordinate layout of the work and resolve potential conflicts before proceeding with the work.

3.06. AS-BUILT DOCUMENTS **(See also UGC Article 6):**

The Contractor shall maintain on a separate set of the Contract Documents a record of all changes made during construction (As-Built Documents). The Contractor shall be responsible for keeping these records and neatly noting with colored pencil or ink all changes. Progress payments will not be made to the Contractor unless such records are maintained. Verification by the On-Site ODR of such records is solely for assurance that the records are being maintained. Such inspections shall not constitute review or approval of the as-built documents for accuracy or completeness.

3.07 SPECIAL CONDITIONS

A. Need 15 business days lead time for O&M Review.

END OF SECTION

SPECIFICATIONS

CF DICKINSON MARINE LAB
FLOOD REPAIR

TPWD PROJECT NUMBER: 128696

1502 FM 517 EAST
DICKINSON, TX 77539

05/02/2018

100% CD PHASE – ISSUED FOR BID
May 2018

PDG *architects*
3100 Weslayan, Suite 200
Houston, TX 77027

713-629-6100

DIVISION 00 – PROCUREMENT AND CONTRACTING REQUIREMENTS
PROVIDED BY TPWD

DIVISION 01 - GENERAL REQUIREMENTS

DIVISION 02 – EXISTING CONDITIONS

DIVISION 03 – CONCRETE

DIVISION 04 – MASONRY
NOT USED

DIVISION 05 – METALS

DIVISION 06 - WOOD AND PLASTICS

DIVISION 07 - THERMAL AND MOISTURE PROTECTION

DIVISION 08 - DOORS AND WINDOWS

DIVISION 09 – FINISHES

DIVISION 10 – SPECIALTIES
NOT USED

SECTION 011010 OWNER FURNISHED ITEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section provides for handling items specified in this section that shall be furnished by the Owner.

B. Where scheduled, items specified shall be stored and installed by the Contractor; otherwise items shall be stored by the Contractor and installed by the Owner.

1.3 PROJECT CONDITIONS

A. Owner will furnish items as scheduled at end of this Section. The Contractor's work includes providing support systems to receive Owner's equipment, materials and plumbing, mechanical, and electrical connections.

B. Owner Responsibilities:

1. Owner will arrange and pay for delivery of Owner-furnished items according to Contractor's Construction Schedule.
2. After Delivery, Owner will inspect delivered items for damage. Contractor shall be present for and assist in Owner's inspection.
3. If Owner-furnished items are damaged, defective, or missing, Owner will arrange for replacement.
4. Owner will arrange for manufacturer's field services and for delivery of manufacturer's warranties to Contractor.
5. Owner will furnish Contractor the earliest possible delivery date for Owner-furnished products. Using Owner-furnished earliest possible delivery dates, Contractor shall designate delivery dates of Owner-furnished items in Contractor's Construction Schedule.

C. Contractor Responsibilities:

2. Contractor is responsible for receiving, unloading, and handling Owner-furnished items at Project site.
2. Contractor is responsible for protecting Owner-furnished items from damage during storage and handling, including damage from exposure to the elements.
3. If Owner-furnished items are damaged as a result of Contractor's operations, Contractor shall repair or replace them.

4. The Contractor shall determine the specific requirements of each Owner furnished item in order to verify field measurements for an accurate fit.
5. Coordination with applicable trades before installation shall be by the Contractor.

1.4 SEQUENCE AND SCHEDULING

A. Sequence of Owner furnished of equipment installation with other work is required to minimize possibility of damage and soiling during the construction period.

PART 2 - PRODUCTS

2.1 OWNER FURNISHED/CONTRACTOR INSTALLED ITEMS

A. 2X4 Light fixtures for building “A” and building “B”. Owner will not supply any conduits, wiring, etc…

PART 3 - EXECUTION

3.1 INSTALLATION

A. Installation of Owner furnished items shall be in strict accordance with respective manufacturer’s recommendations, applicable industry standards, and Owner’s instructions.

END OF SECTION 011010

SECTION 02 00 00 – MOLD ABATEMENT REPORT BY “QRI”

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the Mold and Abatement Report as issued by “QRI”

A. The attached QRI document titled “Mold Abatement Plan” and requirements for this project apply to Building “B” only. Bldg. “A” abatement should be complete before the Flood Repairs begin.

END OF SECTION 02 00 00

Mold Abatement Plan
Dickinson Marine Laboratory

Presented to:

Texas Parks and Wildlife

1502 FM 517 Rd. E
Dickinson, TX 77539

November 13, 2017

Prepared by:

Dale B. Goodrich Sr.

Certified Mold Inspector (CMI# 82678)

Government and Industry in Harmony with the Environment

1. INTRODUCTION

QRI was requested by Texas Parks and Wildlife Department to provide mold abatement plans for two buildings in the Dickinson Marine Laboratory complex located at 1502 FM 517 Rd E, Dickinson, Texas. The complex consists of two buildings, a combined 8200 square feet with a main building and warehouse type metal building. There are six HVAC units covering the main building and another for the offices and lab in the warehouse building. There were several dehumidifiers throughout the buildings and each area had fans running upon our arrival.

The warehouse building received 8-10" of flood water from Hurricane Harvey that remained approximately 48 hours. All water damaged material was removed immediately, and 4 feet of drywall was removed from the interior walls. The main building incurred approximately 1" of flood water. There was no standing water when employees returned to the building following the hurricane, but everything was wet. All water damaged material was removed immediately and 4' of drywall was removed from interior walls. The GIS Lab/Room 18 has a wooden floor which was wet for some days following the flood. 4 feet of drywall was removed from the interior walls, along with all wet material.

Following a mold inspection conducted by Dale Goodrich (CMI 82678) in September 2017, high *Stachybotrys*, *Chaetomium* and *Aspergillus/Penicillium* counts were identified on the premises of these buildings.

This mold abatement plan will include the following:

- Creation of Containment Areas with Accompanying Floor Plan Diagrams
- Required Measures and Procedures
- Steps and Requirements for Abatement of the Premises
- Cleaning and Decontamination of Building Furniture and Items
- Requirements for Demolition of External Drywall and Wood Sub-floor with Insulation
- Requirements of Oversight Plan
- Logistics of Contractors on Site
- Requirements of Submittals for Materials and Permits
- Worker Safety and Training Requirements
- Requirements of Waste Disposal Plan
- Requirements of Health and Safety Plan

2. RECOMMENDATIONS

It is recommended that the Dickinson Marine Laboratory complex be professionally cleaned due to the *Stachybotrys*, *Chaetomium* and *Aspergillus/Penicillium* counts. *Aspergillus/Penicillium* spores are 0.01-0.10 microns in size and spread very easily. The spores can enter on people, insects, building supplies or through open doors and windows. They are especially abundant following flooding events.

Abatement steps should include:

- Remove/replace exterior drywall in offices 121, 122, and 123.
- Set up a negative air machines and run continuously in each area until cleared of mold.
- Clean each HVAC system, fog with mold preventative, and seal off until buildings are cleared of mold.
- HEPA Vacuum all surfaces in each area.
- Wipe down all surfaces and clean with fungicidal solution and dry thoroughly.
- Fog each building with mold preventative.
- Retest to ensure abatement is complete.

ABATEMENT PLAN

General Objectives

- Divide inventory into salvageable and non-salvageable categories as determined by QRI. Should Dickinson Marine Lab personnel remove any personal effects and wall hangings.
- Dispose of all non-salvageable items following client authorization.
- Salvageable furniture shall be left *in situ* to be wiped down in subsequent cleaning.
- Disposal of all non-salvageable items. Cleaning/decontamination of all salvageable items.
- Remove external drywall from Rooms 121, 122, and 123.
- If the HVAC system ductwork servicing the GIS Lab in Room 118 is not removed as part of the HVAC system replacement, it must be cleaned (subterranean ductwork system).
- An appropriate amount of Negative Air Pressure machines placed throughout the structure. It is estimated that eight machines at 2000 CFM per machine are necessary for this project.
- Once abatement is complete, QRI will replicate the original sampling to ensure a clean breathing space.

Creation of Containment Areas

The entire building shall be contained and isolated during the abatement procedures. The building shall be cleaned in sectors and each sector must have constant negative air pressure.

- Sector 1- Building A: Rooms 101, 102, 103 and Tech Office
- Sector 2- Building A: Rooms 109, 110, 111, 112, 113
- Sector 3- Building A: Rooms 104, 105, 106, 107, 108, Gun Room, and Data Archive

- Sector 4- Building A: Rooms 131, 132, 133, 135, 151 (Men's Room), 152 (Women's Room), and Corridor 1
- Sector 5- Building A: Rooms 119, 120, 121, 122, 123, 124, 125, and Closet 3
- Sector 6- Building A: Rooms 114, 115, 116, 117 and Closets 1, 2
- Sector 7- Building A: Rooms 137 (GIS Lab) and 118
- Sector 8- Building B: Warehouse Offices/Lab

The sectors (Sectors 1 and 5) in the rear of the building will be treated first and abatement will gradually progress to the front of the building (Sector 6). See Figure 1 in Appendix A.

After each sector is cleaned, it will be sealed to prevent reintroduction of spores in the sterile environment. Negative air machines will be in use in the cleaned environments. All elements of the HVAC system should be professionally cleaned and sealed off prior to abatement activities. Immediately after abatement and mold testing, a professionally cleaned or new HVAC system should be made operational to control temperature and humidity.

All abatement/decontamination work shall take place in a containment of 6mm plastic walls, with a zip-wall or Z-flap openings. Containment shall be maintained under negative air pressure, exhausted to the outdoor air, with adequate dehumidification and air scrubbing. Once decontamination containment is established, only essential contractor personnel, QRI representatives and others designated or accompanied by QRI, shall be allowed into the work area and no persons shall be admitted to the work area without a Personal Protective Equipment (PPE) which shall include an N-95 particulate respirator, eye protection
and gloves.

STEP 1: PRELIMINARY MEASURES AND PROCEDURES

- Items shall be divided into two categories; salvageable and non-salvageable as determined by QRI, based on inspection.
- The abatement contractor shall be responsible for the collection and disposal of all non-salvageable items, and shall provide a suitable roll-off or similar on-site container for the collection all non-salvageable furniture/furnishings and other items. Abatement contractor is responsible for the removal of the container and proper disposal of all materials placed inside the container at the end of the project. It is the responsibility of the abatement contractor to ensure that bagged materials and other non-porous materials are removed from the home and placed in the disposal container. No items slated for disposal shall be allowed to be stored or disposed of outside of the disposal container.
- Furniture and larger items that may need disposal shall be directly placed into the roll-offs container without containing them in plastic sheeting or plastic bags.

- Smaller items shall be placed in contractors' bags that shall be sealed at the top with duct tape. Bags shall be placed inside the roll-offs container.
- Once all items slated for disposal have been placed in container, the Abatement Contractor will promptly have container removed from the site.

STEP 2: CLEANING OF PREMISES

The entire building shall be contained and isolated during the abatement procedures. The building shall be cleaned in sectors and each sector must have constant negative air pressure. For the entire building, the following processes will occur:

- A HEPA vacuum is utilized to remove loose debris and mold spores on the walls, floor, furnishings, and ceiling.
- All surfaces are wiped down with an appropriate fungicide
- Areas will be fogged with a fungicidal disinfectant
- Repeat HEPA vacuum process over affected areas.

Abatement workers shall adhere to the Safety Plan as outlined. Dehumidifiers should be running continuously in all sectors during abatement processes.

Required Procedures for Abatement and Dust Control

- The contractor shall isolate the HVAC system. Isolation will be accomplished by the installation of two layers of 6-mil thick polyethylene sheeting. Abatement personnel will shut down or redirect the HVAC system or any mechanical air movement systems for these rooms if possible.
- Place mold remediation warning signs that restrict access to authorized persons at all entrances to the work area.
- Pre-clean the area that will be house the two-stage decontamination unit and then install the decontamination unit. The decontamination shall have water available for the contractor's employees and authorized visitors to wash their hands and face.
- A two-stage decontamination unit shall be used for the decontamination of non-porous materials, construction equipment, personnel and safety equipment. The two-stage unit will have a clean room and a dirty room. Personnel and equipment shall enter and exit the work area through the decontamination unit.
- Designate an equipment cleaning area at a location to permit cleaned equipment to be removed directly from the cleaning area to a designated storage area. The cleaning area should be immediately adjacent to the designated storage area. Isolate the equipment cleaning area and designated storage area with 6-mil polyethylene sheeting. Equipment shall be cleaned using HEPA vacuums and damp wiping techniques. Cover and protect cleaned equipment with 6-mil polyethylene sheeting for the duration of the project.

- Re-clean all fixed surfaces in the work area with a HEPA vacuum and damp wiping techniques.
- Erect enclosures around the immediate area where mold contaminated components will be removed to prevent the release of dust to the remaining work area.
- Place removed materials in 6-mil polyethylene bags or wrap in two layers of 6-mil polyethylene sheeting.
- Clean all surfaces within the abatement area with a HEPA filtered vacuum.
- Establish negative pressure within the erected work areas using HEPA filtered exhaust units that discharge outside the enclosure, preferably to the outside of the building. Negative pressure within the erected enclosure work area is to be maintained with a minimum of 0.02 inches of water column differential relative to the work area outside of the enclosure. This shall be demonstrated with the use of a manometer or similar device.

STEP 3: Cleaning and Decontamination of Salvageable Furniture and Items

- Items designated for cleaning and decontamination shall be cleaned *in situ*. All items shall be cleaned by HEPA vacuuming and dry wiping to remove particulates including mold spores.
- All non-cloth items shall be wiped with a cloth dampened with a biocide as necessary, or dampened with water in the case of wooden furniture or items that may be damaged by the biocide, followed by wiping with a clean dry cloth.
- All fabric items shall be HEPA vacuumed only.
- Following the cleaning of all items, QRI will perform a visual inspection of all items.
- All non-porous items shall be washed in water using a mild dishwashing soap, rinsed in clear water, hand dried with clean dry cloths and placed into the storage containment. The washing of non-porous items can take place out-of-doors and sun dried if desired.

Abatement Contractor shall adhere to the Safety Plan as outlined.

During the containment set-up and the abetment process, the Abatement Contractor is encouraged to consult with QRI regarding disposal and cleaning processes as necessary. All questions or concerns shall be addressed or clarified by QRI personnel.

NOTE: All changes to this protocol shall be subject to approval of the client and must be made by written change order. No changes or additional work shall be performed prior to client approval.

Step 4: Demolition of External Drywall

The external drywall in Rooms 121, 122, and 123 will need to be demolished due to high counts of (Samples S3 and S4 of the Initial Assessment) contained high counts of *Stachybotrys* and *Aspergillus/Penicillium*.

- All materials must be removed from the room including furniture, wall hangings, and personal effects.
- Removed materials must be disposed of in accordance with state and federal non-regulated nonhazardous waste guidelines.
- All equipment and tools used for demolition must be wiped down with a fungicide outside of the affected rooms. Wooden flooring in the GIS Lab/Room 118 to be removed with all accompanying insulation and duct work.

Abatement workers shall adhere to the Safety Plan as outlined.

Removal of Mold Contaminated Drywall.

Remove drywall as specified in the Recommendations. Drywall shall be cut away through the use of spiral cutting saw equipped with a close capture exhaust system attached to a HEPA filtered vacuum for dust control. The cutting depth of the spiral saw will be adjusted to a depth slightly less than the thickness of the drywall. Final cutting of the scored drywall will be made with a razor knife to avoid release of dust into the wall cavity and to prevent damage to concealed equipment, or additional layers of wall board that are present. In areas where access restrictions prevent use of spiral saws, hand saws may be used, but only while a HEPA vacuum is used to capture dust at the point of generation. Reciprocating saws shall not be used.

If, upon inspection by the QRI Representative, visual evidence of mold growth on the remaining previously concealed layer is discovered, then the next layer will be treated or removed. If the next layer is removed, the amount of the second layer will not exceed the area of the first section, unless authorized by the QRI Representative.

Removal of Mold Contaminated Wooden Sub-Flooring in Room 118 GIS Lab

Locate the nails in the subfloor. There will be parallel lines where the subfloor is nailed to the joists. Place the tip of the flat prybar at the intersection where two pieces are nailed to a floor joist. Hit the end of the prybar hard with a hammer to drive it down between the two pieces of subfloor.

Using a prybar, lift the edge of the plywood up off the joist as far as possible. Remove the prybar. Using the opening, insert the prybar into the crack as far to the edge as possible. Continue down the edge until one sheet or section of the subfloor is loose from the joist.

Use the first section removed to stand on while you remove other pieces. As you progress removing pieces, slide the safety piece and lift it to a 90-degree angle, pulling the remainder of the nails loose on the opposite side. Lift the piece up and place it in the middle of the floor. Pull out all the nails with the claw hammer. This will be the safety piece. Place it back over the joists at a skewed or slight angle to stand on while working.

Any insulation encountered is to be disposed of in 6 mil polyethylene bags.

HVAC System Decontamination. The HVAC system shall be shut down prior to work.

- The work area shall be completely isolated from other areas of the HVAC system using 6 mil polyethylene sheeting and duct tape. The access areas for the duct work shall be enclosed in a negative pressure enclosure.
- A two-stage decontamination system shall be used.
- Remove all mold contaminated materials including interior insulation of interior lined ducts and filters.
- If contaminated interior insulation cannot be adequately removed, or if the interior sections cannot be adequately cleaned, those HVAC system components are to be removed in entirety.
- HEPA vacuum all interior and exterior surfaces of the HVAC system in the work area.
- Clean all surfaces with a damp cloth and/or mop and a detergent solution. A fungicide may be used in certain areas of the HVAC system, such as cooling coils and condensate pans. The type used will depend on recommendations from the HVAC manufacturer. The contractor shall provide information on any fungicides proposed to be used to the RE prior to initiation of work.
- Allow all areas to thoroughly dry.
- All areas shall be left dry and visibly free of mold contamination and debris.

Waste Disposal

All mold contaminated waste is to be double sealed or bagged in labeled 6 mil polyethylene sheeting or bags. Each bag shall be adequately sealed. The seams of the sheeting shall be sealed with duct tape. The outside of the bags or sheeting shall be visibly clean before transporting to the outside of the abatement areas.

The contractor is responsible for proper packaging, temporary storage, transport, and disposal of all waste generated as the result of this project. All waste is to be classified as non-hazardous and is to be disposed of at a sanitary landfill.

Logistics of personnel on site

- No unauthorized personnel onsite
- Contractors are to keep work areas neat and free of clutter. All debris is to be containerized as it is generated.

- Parking and staging of vehicles, dumpsters, trailers, etc. will be released at kickoff meeting.
- No unauthorized pictures without TPWD approval

Oversight Plan

The disposal and cleaning of all items shall be performed with QRI oversight. The salvageable status of all items shall be performed by QRI and communicated to the contractor.

Primary responsibilities will be:

- Ensuring safety of all personnel involved in abatement processes.
- Ensuring all work is completed in accordance with TDSHS and Texas Commission on Environmental Quality (TCEQ) requirements, including all notification requirements by the abatement contractor.
- Ensuring the compliance of the established protocol
- Shall ensure that all contractors have appropriate licenses.
- Ensuring the project is completed in a timely manner.
- Verify that all handling and disposal of waste is completed in accordance with the waste removal specifications and TCEQ requirements, including all notification requirements.
- Acting as client liaison with abatement contractor.
- Prepare a final report containing all supporting documentation for the project.
-

Requirements of Submittals for Materials and Permits

Abatement contractors will be required to submit a list of the following:

- Materials and equipment needed to complete the scope of work.
- Submit waste disposal site requirements as necessary.
- Any State and local permits that may be required.

Worker Safety and Training Requirements

All activities on site shall adhere to Section 295.304 of the Texas Mold Assessment and Remediation Rules. All training and license of each onsite employee will be required to be current and up to date. All onsite workers shall have, at the minimum, the following training and licensure:

- Mold Remediation Worker license as required in Section 295.314 of the Texas Mold Assessment and Remediation Rules.
- Mold Remediation Contractor license as required in Section 295.315 Texas Mold Assessment and Remediation Rules.
- A copy of the all training certificate of all workers on site is required to be present at the work site at all times.

- All workers onsite are to have in their physical possession a valid government issued photo identification at all times while performing mold remediation work.

- All training shall adequately address the following areas and shall include hands-on training in the areas described:

Sources of indoor mold and conditions necessary for indoor mold growth. Potential health effects and symptoms from mold exposure, in accordance with a training protocol developed in consultation with state professional associations, including at least one representing physicians.

- Workplace hazards and safety, personal protective equipment including respirators, personal hygiene, personal decontamination, confined spaces, and water, structural, and electrical hazards.

- Notice signs. Signs advising that a mold remediation project is in progress shall be displayed at all accessible entrances to remediation areas. The signs shall be at least eight (8) inches by ten (10) inches in size and shall bear the words “NOTICE: Mold remediation project in progress” in black on a yellow background. The text of the signs must be legible from a distance of ten (10) feet.

Requirements of Health and Safety Plan

The Abatement Contractor shall submit a Safety Plan which will contain the following:

- Job Hazard Analysis for each task to be performed.
- PPE Requirements.
- Hand Tool Safety
- Heat Stress Safety
- Lifting Techniques
- First Aid
- Fire Safety
- Hospital Routes
- Evacuation Routes
- List of Emergency Contacts
- Chain of Command
- Personal Hygiene
- Preventive maintenance of safety equipment.
- SDS of any chemicals brought onsite.
- Daily Site Safety Meetings
- Sign in Log

APPENDIX A

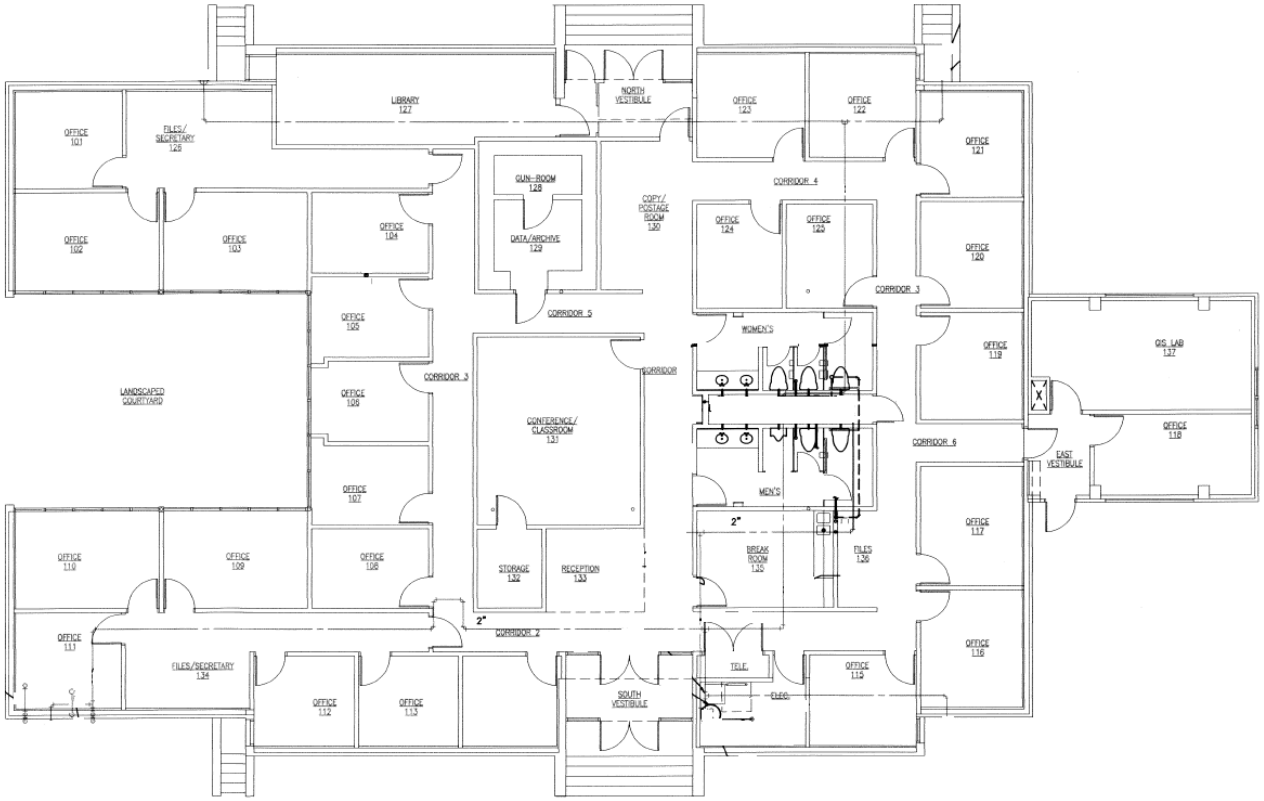

Figure 1

Appendix B

Figure 1: Room 122 Location of Stachybotrys Removed

Figure 2: Room 121 Drywall to be

Figure 3: Room 127 Example of HVAC Register with Mold Present

Figure 4: Room 118/GIS Lab Example of Wooden Sub-Floor to be Removed

SECTION 02 41 19 - SELECTIVE DEMOLITION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Procedures for demolition and removal of existing building elements.
2. Removal of designated building equipment and fixtures.
3. Existing Hazardous materials.
4. Salvaged items.
5. Salvaged material.
6. Salvaged items for re-use.
7. Abatement of Mold, refer to section 02 00 00 “Mold Abatement Plan by (QRI)”

1.2 SYSTEM DESCRIPTION

A. The extent of Selective Demolition Work is that Work necessary, and required to facilitate the new construction indicated.

B. Demolition shall be such that all construction, new and existing, can be performed, and completed in accordance with the construction documents.

C. The contractor shall visit the project site and familiarize himself with the existing conditions and project requirements.

D. Verify the scope of the Work under this Section including salvage material.

1.3 PROJECT SITE

A. Indicated "Existing Construction" was obtained from existing drawings or other information which may not reflect actual conditions. The Contractor shall verify all existing conditions and notify the Owner of discrepancies before proceeding with the Work.

B. Perform the removal, cutting, drilling, etc., of existing work with extreme care, and using small tools in order not to jeopardize the structural integrity of the building.

C. Occupancy: Contractor shall have full use of the facility during construction.

D. Condition of Structure: The Owner assumes no responsibility for the actual condition of portions of the structure to be demolished.

E. Partial removal: Items of salvageable value to the Contractor may be removed from the structure as the work progresses if not claimed by the Owner. Salvaged items must be transported from the site as they are removed.

F. Protection: Make sure that the safe passage of persons around the area of demolition is maintained during the demolition operation. Conduct operations to prevent injury to adjacent buildings, structures, other facilities, and persons.

1.4 PROTECTION OF EXISTING CONSTRUCTION

A. Provide temporary protection of existing construction (floors, roof, and walls) when adjoining new work and in traffic areas.

B. Provide temporary construction, constructed of framing and plywood, to protect existing construction and surrounding surfaces from damage by movement of materials and personnel.

C. The contractor is responsible for all damage to existing structure and shall replace or repair all areas of damage.

D. Repair, replace, or rebuild existing construction as required or as directed which has been removed, altered or disrupted to allow for new construction. Existing construction shall be corrected to match adjacent construction, new or existing.

E. Perform cutting of existing concrete and masonry construction with saws and core drills. Do not use jack-hammers or explosives.

1.5 FIELD CONDITIONS

A. Hazardous Materials: Hazardous materials are present in buildings and structures to be selectively demolished. The Hazardous Material Report (including remediation specifications) is attached elsewhere in the Contract Documents.

B. Examine the report to become aware of locations where hazardous materials are present.

PART 2 - PRODUCTS

2.1 SALVAGED ITEMS

A. The Contract Documents indicate the existing materials that are to be reinstalled in the new construction. The Contractor shall remove, protect and reinstall these items as indicated.

1. Items for "Reinstallation" will be indicated as such within the Contract Documents.

B. Materials scheduled for reinstallation which are damaged by the Contractor to the extent that they cannot be reinstalled shall be replaced by the Contractor with equal quality material at no additional cost to the Owner.

C. Coordinate with the Owner on disposition of salvage items note scheduled for reinstallation, demolished materials, and equipment. Salvaged materials, not reinstalled, shall be delivered, as directed, to the Owner.

2.2 SALVAGED MATERIALS

A. Removed and salvaged materials of value not designated for reinstallation, unless claimed as salvage by the Owner, shall become the property of the Contractor and shall be removed from the premises by the Contractor and recycled, reused or disposed of.

2.3 SALVAGED ITEMS FOR RE-USE

A. Materials and items scheduled for re-use which are damaged by the contractor to the extent which they cannot be re-used shall be replaced by the Contractor at no additional cost to the Owner.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verification of Conditions: Verify that field measurements, surfaces, substrates and conditions are as required, and ready to receive Work.

B. Report in writing to Owner prevailing conditions that will adversely affect satisfactory execution of the Work of this Section. Do not proceed with Work until unsatisfactory conditions have been corrected.

C. By beginning Work, Contractor accepts conditions and assumes responsibility for correcting unsuitable conditions encountered at no additional cost to the Owner.

3.2 PREPARATION

A. Temporary Support: Provide adequate temporary support for work to be cut to prevent failure. Do not endanger other work.

B. Provide adequate protection of other work during selective demolition to prevent damage and provide protection of the work from adverse weather exposure.

3.3 PROCEDURE

A. Employ only skilled tradesmen to perform selective demolition.

B. Cut work by methods least likely to damage work to the retained and work adjoining.

C. In general, where physical cutting action is required, cut work with sawing and grinding tools, not with hammering and chopping tools. Core drill openings through concrete and masonry work.

D. Patch with seams which are durable and as invisible as possible. Comply with specified tolerances for the work.

E. Where selective demolition terminates at a surface or finish to remain, completely remove all traces of material selectively demolished, including mortar beds. Provide smooth, even, substrate transition.

3.4 POLLUTION CONTROLS

A. Use temporary enclosures and other suitable methods to limit the amount of dust and dirt rising and scattering in the air to the lowest practical level.

B. Comply with governing authorities pertaining to environmental protection.

C. Clean adjacent portion of the structure and improvement of dust, dirt and debris caused by demolition operations, as directed by Owner and governing authorities. Return adjacent areas to conditions existing prior to the start of the work.

END OF SECTION 02 41 19

SECTION 033000 -CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 SUMMARY

A. This Section specifies cast-in-place concrete, including formwork, reinforcement, concrete materials, mixture design, placement procedures, and finishes, for the following:

1. Concrete grade beams, slabs, footings, stairs and retaining walls.

B. Cementitious Materials: Portland cement alone or in combination with one or more of the following: blended hydraulic cement, fly ash and other pozzolans, ground granulated blast-furnace slag, and silica fume; subject to compliance with requirements.

1.2 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Design Mixtures: For each concrete mixture. Submit alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.

1. Indicate amounts of mixing water to be withheld for later addition at Project site.

C. Steel Reinforcement Shop Drawings: Placing drawings that detail fabrication, bending, and placement. Include bar sizes, lengths, material, grade, bar schedules, stirrup spacing, bent bar diagrams, bar arrangement, splices and laps, mechanical connections, tie spacing, hoop spacing, and supports for concrete reinforcement.

D. Material Test Reports: For the following, from a qualified testing agency, indicating compliance with requirements:

1. Aggregates.

E. Material Certificates: For each of the following, signed by manufacturers:

1. Cementitious materials.

2. Admixtures.

3. Form materials and form-release agents.

4. Steel reinforcement and accessories.

5. Waterstops.

6. Curing compounds.

7. Floor and slab treatments.

8. Vapor retarders.

9. Repair materials.

10. Joint filler

1.3 QUALITY ASSURANCE

A. Installer Qualifications: A qualified installer who employs on Project personnel qualified as ACI-certified Flatwork Technician and Finisher and a supervisor who is an ACI-certified Concrete Flatwork Technician.

B. Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C 94/C 94M requirements for production facilities and equipment.

1. Manufacturer certified according to NRMCA's "Certification of Ready Mixed Concrete Production Facilities."

C. Source Limitations: Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant, obtain aggregate from one source, and obtain admixtures through one source from a single manufacturer.

D. ACI Publications: Comply with the following unless modified by requirements in the Contract Documents:

1. ACI 301, "Specification for Structural Concrete."

2. ACI 117, "Specifications for Tolerances for Concrete Construction and Materials."

1.4 DELIVERY, STORAGE, AND HANDLING

A. Steel Reinforcement: Deliver, store, and handle steel reinforcement to prevent bending and damage.

B. Waterstops: Store waterstops under cover to protect from moisture, sunlight, dirt, oil, and other contaminants.

PART 2 - PRODUCTS

2.1 PRODUCT REQUIREMENTS

A. Iron or steel products produced through a manufacturing process shall be produced in the United States. These products includes but not limited to:

1. Concrete reinforcing
2. Miscellaneous Steel

2.2 FORM-FACING MATERIALS

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

1. Plywood, metal, or other approved panel materials.

B. Rough-Formed Finished Concrete: Plywood, lumber, metal, or another approved material. Provide lumber dressed on at least two edges and one side for tight fit.

C. Chamfer Strips: Wood, metal, PVC, or rubber strips, 3/4 by 3/4 inch (19 by 19 mm), minimum.

D. Rustication Strips: Wood, metal, PVC, or rubber strips, kerfed for ease of form removal.

E. Form-Release Agent: Commercially formulated form-release agent that will not bond with, stain, or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces.

1. Formulate form-release agent with rust inhibitor for steel form-facing materials.

F. Form Ties: Factory-fabricated, removable or snap-off metal or glass-fiber-reinforced plastic form ties designed to resist lateral pressure of fresh concrete on forms and to prevent spalling of concrete on removal.

1. Furnish ties that, when removed, will leave holes no larger than 1 inch (25 mm) in diameter in concrete surface.

2.3 STEEL REINFORCEMENT

A. Reinforcing Bars: ASTM A 615/A 615M, Grade 60 (Grade 420), deformed.

B. Plain-Steel Welded Wire Reinforcement: ASTM A 185, plain, fabricated from as-drawn steel wire into flat sheets.

2.4 REINFORCEMENT ACCESSORIES

A. Joint Dowel Bars: ASTM A 615/A 615M, Grade 60 (Grade 420), plain-steel bars, cut bars 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. Manufacture bar supports from steel wire, plastic, or precast concrete according to CRSI's "Manual of Standard Practice," of greater compressive strength than concrete and as follows:

1. For concrete surfaces exposed to view where legs of wire bar supports contact forms, use CRSI Class 1 plastic-protected steel wire or CRSI Class 2 stainless-steel bar supports.

2.5 CONCRETE MATERIALS

A. Cementitious Material: Use the following cementitious materials, of the same type, brand, and source, throughout Project:

1. Portland Cement: ASTM C 150, Type I.

a. Fly Ash: ASTM C 618, Class F.

B. Normal-Weight Aggregates: ASTM C 33.

1. Maximum Coarse-Aggregate Size: 3/4” maximum aggregate size.

2. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.

C. Water: ASTM C 94/C 94M and potable.

2.6 ADMIXTURES

A. Air-Entraining Admixture: ASTM C 260.

B. Chemical Admixtures: Provide admixtures certified by manufacturer to be compatible with other admixtures and that will not contribute water-soluble chloride ions exceeding those permitted in hardened concrete. Do not use calcium chloride or admixtures containing calcium chloride.

1. Water-Reducing Admixture: ASTM C 494/C 494M, Type A.

2. Retarding Admixture: ASTM C 494/C 494M, Type B.

3. Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type D.

4. High-Range, Water-Reducing Admixture: ASTM C 494/C 494M, Type F.

5. High-Range, Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type G.

6. Plasticizing and Retarding Admixture: ASTM C 1017/C 1017M, Type II.

2.7 WATERSTOPS

A. Self-Expanding Butyl Strip Waterstops: Manufactured rectangular or trapezoidal strip, butyl rubber with sodium bentonite or other hydrophilic polymers, for adhesive bonding to concrete, 3/4 by 1 inch (19 by 25 mm).

1. Available Products:

a. Colloid Environmental Technologies Company; Volclay Waterstop-RX.

b. Greenstreak; Swellstop.

c. Henry Company, Sealants Division; Synko-Flex.

2.8 VAPOR RETARDERS

A. Plastic Vapor Retarder: ASTM E 1745, Class B, not less than 10 mils thick. Include manufacturer's recommended adhesive or pressure-sensitive joint tape.

2.9 CURING MATERIALS

A. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. (305 g/sq. m) when dry.

B. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.

C. Water: Potable.

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

1. Available Products:

a. Burke by Edoco; Aqua Resin Cure.

b. ChemMasters; Safe-Cure Clear.

c. Conspec Marketing & Manufacturing Co., Inc., a Dayton Superior Company; W.B. Resin Cure.

d. Dayton Superior Corporation; Day Chem Rez Cure (J-11-W).

e. Euclid Chemical Company (The); Kurez DR VOX.

f. Meadows, W. R., Inc.; 1100 Clear.

2.10 REPAIR MATERIALS

A. Repair Underlayment: Cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/8 inch (3.2 mm) and that can be feathered at edges to match adjacent floor elevations.

1. Cement Binder: ASTM C 150, portland cement or hydraulic or blended hydraulic cement as defined in ASTM C 219.

2. Primer: Product of underlayment manufacturer recommended for substrate, conditions, and application.

3. Aggregate: Well-graded, washed gravel, 1/8 to 1/4 inch (3.2 to 6 mm) or coarse sand as recommended by underlayment manufacturer.

4. Compressive Strength: Not less than 5000 psi at 28 days when tested according to ASTM C 109/C 109M.

B. Repair Overlayment: Cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/8 inch (3.2 mm) and that can be feathered at edges to match adjacent floor elevations.

1. Cement Binder: ASTM C 150, portland cement or hydraulic or blended hydraulic cement as defined in ASTM C 219.

2. Primer: Product of topping manufacturer recommended for substrate, conditions, and application.

3. Aggregate: Well-graded, washed gravel, 1/8 to 1/4 inch (3.2 to 6 mm) or coarse sand as recommended by topping manufacturer.

4. Compressive Strength: Not less than 5000 psi at 28 days when tested according to ASTM C 109/C 109M.

2.11 JOINT FILLER

A. Semirigid Joint Filler: Two-component, semirigid, 100 percent solids, aromatic polyurea with a Type A shore durometer hardness range of 80 per ASTM D 2240. Available Products:
1. Euclid Chemical Company; Euco QWIKjoint.
2. L&M Construction Chemicals, Inc.; Joint Tite 750.
3. Nox-crete; Dynaflex JF-85.

2.12 CONCRETE MIXTURES, GENERAL

A. Prepare design mixtures for each type and strength of concrete, proportioned on the basis of laboratory trial mixture or field test data, or both, according to ACI 301.

1. Use a qualified independent testing agency for preparing and reporting proposed mixture designs based on laboratory trial mixtures.

B. Admixtures: Use admixtures according to manufacturer's written instructions.

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

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

2.13 CONCRETE MIXTURES FOR BUILDING ELEMENTS

A. Refer to the Structural Notes.

2.14 FABRICATING REINFORCEMENT

A. Fabricate steel reinforcement according to CRSI's "Manual of Standard Practice."

2.15 CONCRETE MIXING

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

1. When air temperature is between 85 and 90 deg F (30 and 32 deg C), reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F (32 deg C), reduce mixing and delivery time to 60 minutes.

PART 3 - EXECUTION

3.1 FORMWORK

A. Design, erect, shore, brace, and maintain formwork, according to ACI 301, to support vertical, lateral, static, and dynamic loads, and construction loads that might be applied, until structure can support such loads.

B. Construct formwork so concrete members and structures are of size, shape, alignment, elevation, and position indicated, within tolerance limits of ACI 117.

C. Limit concrete surface irregularities, designated by ACI 347R as abrupt or gradual, as follows:

1. Class D, 1 inch (25 mm).

D. Construct forms tight enough to prevent loss of concrete mortar.

E. Fabricate forms for easy removal without hammering or prying against concrete surfaces. Provide crush or wrecking plates where stripping may damage cast concrete surfaces. Provide top forms for inclined surfaces steeper than 1.5 horizontal to 1 vertical.

1. Install keyways, reglets, recesses, and the like, for easy removal.

2. Do not use rust-stained steel form-facing material.

F. Set edge forms, bulkheads, and intermediate screed strips for slabs to achieve required elevations and slopes in finished concrete surfaces. Provide and secure units to support screed strips; use strike-off templates or compacting-type screeds.

G. Provide temporary openings for cleanouts and inspection ports where interior area of formwork is inaccessible. Close openings with panels tightly fitted to forms and securely braced to prevent loss of concrete mortar. Locate temporary openings in forms at inconspicuous locations.

H. Chamfer exterior corners and edges of permanently exposed concrete.

I. Form openings, chases, offsets, sinkages, keyways, reglets, blocking, screeds, and bulkheads required in the Work. Determine sizes and locations from trades providing such items.

J. Clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, and other debris just before placing concrete.

K. Retighten forms and bracing before placing concrete, as required, to prevent mortar leaks and maintain proper alignment.

L. Coat contact surfaces of forms with form-release agent, according to manufacturer's written instructions, before placing reinforcement.

3.2 EMBEDDED ITEMS

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

1. Install anchor rods, accurately located, to elevations required and complying with tolerances in Section 7.5 of AISC's "Code of Standard Practice for Steel Buildings and Bridges."

3.3 REMOVING AND REUSING FORMS

A. General: Formwork for sides of beams, walls, columns, and similar parts of the Work that does not support weight of concrete may be removed after cumulatively curing at not less than 50 deg F (10 deg C) for 24 hours after placing concrete, if concrete is hard enough to not be damaged by form-removal operations and curing and protection operations are maintained.

1. Leave formwork for beam soffits, joists, slabs, and other structural elements that supports weight of concrete in place until concrete has achieved at least 70 percent of its 28-day design compressive strength.

B. Clean and repair surfaces of forms to be reused in the Work. Split, frayed, delaminated, or otherwise damaged form-facing material will not be acceptable for exposed surfaces. Apply new form-release agent.

C. When forms are reused, clean surfaces, remove fins and laitance, and tighten to close joints. Align and secure joints to avoid offsets. Do not use patched forms for exposed concrete surfaces unless approved by Architect.

3.4 VAPOR RETARDERS

A. Plastic Vapor Retarders: Place, protect, and repair vapor retarders according to ASTM E 1643 and manufacturer's written instructions.

1. Lap joints 6 inches (150 mm) and seal with manufacturer's recommended tape.

3.5 STEEL REINFORCEMENT

A. General: Comply with CRSI's "Manual of Standard Practice" for placing reinforcement.

1. Do not cut or puncture vapor retarder. 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 would reduce bond to concrete.

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

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

E. Install welded wire reinforcement in longest practicable lengths on bar supports spaced to minimize sagging. Lap edges and ends of adjoining sheets at least one mesh spacing. Offset laps of adjoining sheet widths to prevent continuous laps in either direction. Lace overlaps with wire.

3.6 JOINTS

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

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

1. Place joints perpendicular to main reinforcement. Continue reinforcement across construction joints, unless otherwise indicated. Do not continue reinforcement through sides of strip placements of floors and slabs.

2. Form keyed joints as indicated. Embed keys at least 1-1/2 inches (38 mm) into concrete.

3. Locate joints for beams, slabs, joists, and girders in the middle third of spans. Offset joints in girders a minimum distance of twice the beam width from a beam-girder intersection.

4. Locate horizontal joints in walls and columns at underside of floors, slabs, beams, and girders and at the top of footings or floor slabs.

5. Space vertical joints in walls as indicated. Locate joints beside piers integral with walls, near corners, and in concealed locations where possible.

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

1. Sawed Joints: Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch- wide joints into concrete when cutting action will not tear, abrade, or otherwise damage surface and before concrete develops random contraction cracks.

D. 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.

3.7 WATERSTOPS

A. Self-Expanding Strip Waterstops: Install in construction joints and at other locations indicated, according to manufacturer's written instructions, adhesive bonding, mechanically fastening, and firmly pressing into place. Install in longest lengths practicable.

3.8 CONCRETE PLACEMENT

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

B. Before test sampling and placing concrete, water may be added at Project site, subject to limitations of ACI 301.

1. Do not add water to concrete after adding high-range water-reducing admixtures to mixture.

C. Deposit concrete continuously in one layer or in horizontal layers of such thickness that no new concrete will be placed on concrete that has hardened enough to cause seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as indicated. Deposit concrete to avoid segregation.

1. Deposit concrete in horizontal layers of depth to not exceed formwork design pressures and in a manner to avoid inclined construction joints.

2. Consolidate placed concrete with mechanical vibrating equipment according to ACI 301.

3. Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations to rapidly penetrate placed layer and at least 6 inches (150 mm) into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to lose plasticity. At each insertion, limit duration of vibration to time necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing mixture constituents to segregate.

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

1. Consolidate concrete during placement operations so concrete is thoroughly worked around reinforcement and other embedded items and into corners.

2. Maintain reinforcement in position on chairs during concrete placement.

3. Screed slab surfaces with a straightedge and strike off to correct elevations.

4. Slope surfaces uniformly to drains where required.

5. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane, before excess bleedwater appears on the surface. Do not further disturb slab surfaces before starting finishing operations.

E. Cold-Weather Placement: Comply with ACI 306.1 and as follows. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.

1. When average high and low temperature is expected to fall below 40 deg F (4.4 deg C) for three successive days, maintain delivered concrete mixture temperature within the temperature range required by ACI 301.

2. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.

3. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in mixture designs.

F. Hot-Weather Placement: Comply with ACI 301 and as follows:

1. Maintain concrete temperature below 90 deg F (32 deg C) at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated to total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.

2. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade uniformly moist without standing water, soft spots, or dry areas.

3.9 FINISHING FORMED SURFACES

A. Rough-Formed Finish: As-cast concrete texture imparted by form-facing material with tie holes and defects repaired and patched. Remove fins and other projections that exceed specified limits on formed-surface irregularities.

1. Apply to all concrete surfaces unless noted otherwise

B. Smooth-Formed Finish: As-cast concrete texture imparted by form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams. Repair and patch tie holes and defects. Remove fins and other projections that exceed specified limits on formed-surface irregularities.

1. Apply to concrete surfaces where indicated on the Drawings.

C. Related Unformed Surfaces: At tops of walls, horizontal offsets, and similar unformed surfaces adjacent to formed surfaces, strike off smooth and finish with a texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces, unless otherwise indicated.

3.10 FINISHING FLOORS AND SLABS

A. General: Comply with ACI 302.1R recommendations for screeding, restraightening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.

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

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

3.11 MISCELLANEOUS CONCRETE ITEMS

A. Filling In: Fill in holes and openings left in concrete structures, unless otherwise indicated, after work of other trades is in place. Mix, place, and cure concrete, as specified, to blend with in-place construction. Provide other miscellaneous concrete filling indicated or required to complete the Work.

B. Curbs: Provide monolithic finish to interior curbs by stripping forms while concrete is still green and by steel-troweling surfaces to a hard, dense finish with corners, intersections, and terminations slightly rounded.

C. Equipment Bases and Foundations: Provide machine and equipment bases and foundations as shown on Drawings. Set anchor bolts for machines and equipment at correct elevations, complying with diagrams or templates from manufacturer furnishing machines and equipment.

1. Housekeeping pads: Concrete fill shall be normal weight concrete (3000 psi), reinforced with 4x4-W2.1xW2.1 welded wire fabric set at middepth of pad. Trowel concrete to a dense, smooth finish. Set anchor bolts for securing mechanical or electrical equipment during pouring of concrete fill.

3.12 CONCRETE PROTECTING AND CURING

A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection and ACI 301 for hot-weather protection during curing.

B. Evaporation Retarder: Apply evaporation retarder to unformed concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h (1 kg/sq. m x h) before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.

C. Formed Surfaces: Cure formed concrete surfaces, including underside of beams, supported slabs, and other similar surfaces. If forms remain during curing period, moist cure after loosening forms. If removing forms before end of curing period, continue curing for the remainder of the curing period.

D. Unformed Surfaces: Begin curing immediately after finishing concrete. Cure unformed surfaces, including floors and slabs, concrete floor toppings, and other surfaces.

E. Cure concrete according to ACI 308.1, by one or a combination of the following methods:

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

a. Water.

b. Continuous water-fog spray.

c. Absorptive cover, water saturated, and kept continuously wet. Cover concrete surfaces and edges with 12-inch (300-mm) lap over adjacent absorptive covers.

2. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches (300 mm), and sealed by waterproof tape or adhesive. Cure for not less than seven days. Immediately repair any holes or tears during curing period using cover material and waterproof tape.

   a. Cure concrete surfaces to receive floor coverings with either a moisture-retaining cover or a curing compound that the manufacturer certifies will not interfere with bonding of floor covering used on Project..

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

3.13 CONCRETE SURFACE REPAIRS

A. Defective Concrete: Repair and patch defective areas when approved by Architect. Remove and replace concrete that cannot be repaired and patched to Architect's approval.

B. Patching Mortar: Mix dry-pack patching mortar, consisting of one part portland cement to two and one-half parts fine aggregate passing a No. 16 (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 in solid concrete, but not less than 1 inch (25 mm) in depth. Make edges of cuts perpendicular to concrete surface. Clean, dampen with water, and brush-coat holes and voids with bonding agent. Fill and compact with patching mortar before bonding agent has dried. Fill form-tie voids with patching mortar or cone plugs secured in place with bonding agent.

2. Repair defects on surfaces exposed to view by blending white portland cement and standard portland cement so that, when dry, patching mortar will match surrounding color. Patch a test area at inconspicuous locations to verify mixture and color match before proceeding with patching. Compact mortar in place and strike off slightly higher than surrounding surface.

3. Repair defects on concealed formed surfaces that affect concrete's durability and structural performance as determined by Architect.

D. Repairing Unformed Surfaces: Test unformed surfaces, such as floors and slabs, for finish and verify surface tolerances specified for each surface. Correct low and high areas. Test surfaces sloped to drain for trueness of slope and smoothness; use a sloped template.

1. Repair finished surfaces containing defects. Surface defects include spalls, popouts, honeycombs, rock pockets, crazing and cracks in excess of 0.01 inch (0.25 mm) wide or that penetrate to reinforcement or completely through unreinforced sections regardless of width, and other objectionable conditions.

2. After concrete has cured at least 14 days, correct high areas by grinding.

3. Correct localized low areas during or immediately after completing surface finishing operations by cutting out low areas and replacing with patching mortar. Finish repaired areas to blend into adjacent concrete.

4. Correct other low areas scheduled to receive floor coverings with a repair underlayment. Prepare, mix, and apply repair underlayment and primer according to manufacturer's written instructions to produce a smooth, uniform, plane, and level surface. Feather edges to match adjacent floor elevations.

5. 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. Remove defective areas with clean, square cuts and expose steel reinforcement with at least a 3/4-inch (19-mm) clearance all around. Dampen concrete surfaces in contact with patching concrete and apply bonding agent. Mix patching concrete of same materials and mixture as original concrete except without coarse aggregate. Place, compact, and finish to blend with adjacent finished concrete. Cure in same manner as adjacent concrete.

6. Repair random cracks and single holes 1 inch (25 mm) or less in diameter with patching mortar. Groove top of cracks and cut out holes to sound concrete and clean off dust, dirt, and loose particles. Dampen cleaned concrete surfaces and apply bonding agent. Place patching mortar before bonding agent has dried. Compact patching mortar and finish to match adjacent concrete. Keep patched area continuously moist for at least 72 hours.

E. Perform structural repairs of concrete, subject to 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.

3.14 JOINT FILLING

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

1. Defer joint filling until concrete has aged at least three month(s). 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 joint 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. Overfill joint and trim joint filler flush with top of joint after hardening.

3.15 FIELD QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified testing and inspecting agency to perform tests and inspections and to submit reports.

B. Concrete Tests: Testing of composite samples of fresh concrete obtained according to ASTM C 172 shall be performed according to the following requirements:

1. Testing Frequency: Obtain at least one composite sample for each 100 cu. yd. (76 cu. m) or fraction thereof of each concrete mixture placed each day.

    a. When frequency of testing will provide fewer than five compressive-strength tests for each concrete mixture, testing shall be conducted from at least five randomly selected batches or from each batch if fewer than five are used.

2. Slump: ASTM C 143/C 143M; one test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mixture. Perform additional tests when concrete consistency appears to change.

3. Air Content: ASTM C 231, pressure method, for normal-weight concrete; one test for each composite sample, but not less than one test for each day's pour of each concrete mixture.

4. Concrete Temperature: ASTM C 1064/C 1064M; one test hourly when air temperature is 40 deg F (4.4 deg C) and below and when 80 deg F (27 deg C) and above, and one test for each composite sample.

5. Compression Test Specimens: ASTM C 31/C 31M.

    a. Cast and laboratory cure two sets of two standard cylinder specimens for each composite sample.

6. Compressive-Strength Tests: ASTM C 39/C 39M; test one set of two laboratory-cured specimens at 7 days and one set of two specimens at 28 days.

a. Test one set of two field-cured specimens at 7 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. 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).

8. Test results shall be reported in writing to Architect, concrete manufacturer, and Contractor within 48 hours of testing. Reports of compressive-strength tests shall contain Project identification name and number, date of concrete placement, name of concrete testing and inspecting agency, location of concrete batch in Work, design compressive strength at 28 days, concrete mixture proportions and materials, compressive breaking strength, and type of break for both 7- and 28-day tests.

9. Additional Tests: Testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Architect. Testing and inspecting agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C 42/C 42M or by other methods as directed by the Owner.

10. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

11. Correct deficiencies in the Work that test reports and inspections indicate do not comply with the Contract Documents.

END OF SECTION 03 30 00

SECTION 05 52 13 - PIPE AND TUBE RAILINGS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Steel pipe railings.

B. Related Requirements:

1. Section 061000 "Rough Carpentry".

1.2 COORDINATION

A. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' written recommendations to ensure that shop primers and topcoats are compatible with one another.

B. Coordinate installation of anchorages for railings. 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.

C. Schedule installation so wall attachments are made only to completed walls. Do not support railings temporarily by any means that do not satisfy structural performance requirements.

1.3 ACTION SUBMITTALS

A. Product Data: For the following:

1. Manufacturer's product lines of mechanically connected railings.
2. Railing brackets.
3. Grout, anchoring cement, and paint products.

B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.

C. Samples: For each type of exposed finish required.

1. Sections of each distinctly different linear railing member, including handrails, top rails, posts, and balusters.
2. Fittings and brackets.

D. Delegated-Design Submittal: For railings, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.4 INFORMATIONAL SUBMITTALS

A. Welding certificates.

1.5 QUALITY ASSURANCE

A. Welding Qualifications: Qualify procedures and personnel according to the following:

1. AWS D1.1/D1.1M, "Structural Welding Code - Steel."

1.6 DELIVERY, STORAGE, AND HANDLING

A. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

1.7 FIELD CONDITIONS

A. Field Measurements: Verify actual locations of walls and other construction contiguous with metal fabrications by field measurements before fabrication.

PART 2 - PRODUCTS

2.1 PRODUCT REQUIREMENTS

A. Iron or steel products produced through a manufacturing process shall be produced in the United States. These products includes but not limited to:

1. Structural Steel
2. Miscellaneous Steel

2.2 PERFORMANCE REQUIREMENTS

A. Delegated Design: Engage a qualified professional engineer, as defined in Section 014000 "Quality Requirements," to design railings, including attachment to building construction.

B. Structural Performance: Railings, including attachment to building construction, shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:

1. Handrails and Top Rails of Guards:

a. Uniform load of 50 lbf/ ft. applied in any direction.
b. Concentrated load of 200 lbf applied in any direction.
c. Uniform and concentrated loads need not be assumed to act concurrently.

2. Infill of Guards:

a. Concentrated load of 50 lbf applied horizontally on an area of 1 sq. ft.
b. Infill load and other loads need not be assumed to act concurrently.

C. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes.

1. Temperature Change: 120 deg F, ambient; 180 deg F.

2.3 METALS, GENERAL

A. Metal Surfaces, General: Provide materials with smooth surfaces, without seam marks, roller marks, rolled trade names, stains, discolorations, or blemishes.

B. Brackets, Flanges, and Anchors: Cast or formed metal of same type of material and finish as supported rails unless otherwise indicated.

1. Provide type of bracket with predrilled hole for exposed bolt anchorage] and that provides 1-1/2-inch clearance from inside face of handrail to finished wall surface.

2.4 STEEL AND IRON

A. Tubing: ASTM A 500 (cold formed) or ASTM A 513.

B. Pipe: ASTM A 53/A 53M, Type F or Type S, Grade A, Standard Weight (Schedule 40), unless another grade and weight are required by structural loads.

1. Provide galvanized finish for exterior installations and where indicated.

C. Plates, Shapes, and Bars: ASTM A 36/A 36M.

D. Woven-Wire Mesh: Intermediate-crimp, square pattern, 3-inch woven-wire mesh, made from wire complying with ASTM A 510, and with a sufficient diameter to withstand galvanizing after fabrication without visible deformation.

2.5 FASTENERS

A. General: Provide the following:
1. Hot-Dip Galvanized Railings: Type 304 stainless-steel or hot-dip zinc-coated steel fasteners complying with ASTM A 153/A 153M or ASTM F 2329 for zinc coating.
2. Provide exposed fasteners with finish matching appearance, including color and texture, of railings.

B. Fasteners for Anchoring Railings to Other Construction: Select fasteners of type, grade, and class required to produce connections suitable for anchoring railings to other types of construction indicated and capable of withstanding design loads.

C. Fasteners for Interconnecting Railing Components:

1. Provide concealed fasteners for interconnecting railing components and for attaching them to other work, unless otherwise indicated.
2. Provide concealed fasteners for interconnecting railing components and for attaching them to other work, unless exposed fasteners are unavoidable or are the standard fastening method for railings indicated.

3. Provide square or hex socket flat-head machine screws for exposed fasteners unless otherwise indicated.

2.6 MISCELLANEOUS MATERIALS

A. Welding Rods and Bare Electrodes: Select according to AWS specifications for metal alloy welded.

B. Etching Cleaner for Galvanized Metal: Complying with MPI#25.

C. Galvanizing Repair Paint: High-zinc-dust-content paint complying with SSPC-Paint 20 and compatible with paints specified to be used over it.

D. Shop Primer for Galvanized Steel: Water based galvanized metal primer complying with MPI#134.

E. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107/C 1107M. Provide grout specifically recommended by manufacturer for interior and exterior applications.

F. Anchoring Cement: Factory-packaged, nonshrink, nonstaining, hydraulic-controlled expansion cement formulation for mixing with water at Project site to create pourable anchoring, patching, and grouting compound.

1. Water-Resistant Product: At exterior locations and where indicated provide formulation that is resistant to erosion from water exposure without needing protection by a sealer or waterproof coating and that is recommended by manufacturer for exterior use.

2.7 FABRICATION

A. General: Fabricate railings to comply with requirements indicated for design, dimensions, member sizes and spacing, details, finish, and anchorage, but not less than that required to support structural loads. Match existing guardrails at existing.

B. Shop assemble railings to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation. Use connections that maintain structural value of joined pieces.

C. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 inch unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.

D. Form work true to line and level with accurate angles and surfaces.

E. Fabricate connections that are exposed to weather in a manner that excludes water. Provide weep holes where water may accumulate.

F. Cut, reinforce, drill, and tap as indicated to receive finish hardware, screws, and similar items.

G. Connections: Fabricate railings with welded connections unless otherwise indicated.

H. Welded Connections: Cope components at connections to provide close fit, or use fittings designed for this purpose. Weld all around at connections, including at fittings.

1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
2. Obtain fusion without undercut or overlap.
3. Remove flux immediately.
4. At exposed connections, finish exposed surfaces smooth and blended so no roughness shows after finishing and welded surface matches contours of adjoining surfaces.

I. Form Changes in Direction as Follows:

1. By bending.

J. For changes in direction made by bending, use jigs to produce uniform curvature for each repetitive configuration required. Maintain cross section of member throughout entire bend without buckling, twisting, cracking, or otherwise deforming exposed surfaces of components.

K. Close exposed ends of railing members with prefabricated end fittings.

L. Provide wall returns at ends of wall-mounted handrails unless otherwise indicated. Close ends of returns unless clearance between end of rail and wall is 1/4 inch or less.

M. Brackets, Flanges, Fittings, and Anchors: Provide wall brackets, flanges, miscellaneous fittings, and anchors to interconnect railing members to other work unless otherwise indicated.

N. Provide inserts and other anchorage devices for connecting railings to concrete or masonry work. Fabricate anchorage devices capable of withstanding loads imposed by railings. Coordinate anchorage devices with supporting structure.

O. For railing posts set in concrete, provide steel sleeves not less than 6 inches long with inside dimensions not less than 1/2 inch greater than outside dimensions of post, with metal plate forming bottom closure.

P. Woven-Wire Mesh Infill Panels: Fabricate infill panels from woven-wire mesh crimped into 1-by-1/2-by-1/8-inch metal channel frames. Make wire mesh and frames from same metal as railings in which they are installed.

1. Orient wire mesh with wires horizontal and vertical.

Q. Toe Boards: Where indicated, provide toe boards at railings around openings and at edge of open-sided floors and platforms. Fabricate to dimensions and details indicated.

2.8 STEEL AND IRON FINISHES

A. Galvanized Railings:

1. Hot-dip galvanize exterior steel railings, including hardware, after fabrication.
2. Comply with ASTM A 123/A 123M for hot-dip galvanized railings.
3. Comply with ASTM A 153/A 153M for hot-dip galvanized hardware.
4. Fill vent and drain holes that are exposed in the finished Work, unless indicated to remain as weep holes, by plugging with zinc solder and filing off smooth.

B. For galvanized railings, provide hot-dip galvanized fittings, brackets, fasteners, sleeves, and other ferrous components.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Fit exposed connections together to form tight, hairline joints.

B. Perform cutting, drilling, and fitting required for installing railings. Set railings accurately in location, alignment, and elevation; measured from established lines and levels and free of rack.

1. Do not weld, cut, or abrade surfaces of railing components that are coated or finished after fabrication and that are intended for field connection by mechanical or other means without further cutting or fitting.
2. Set posts plumb within a tolerance of 1/16 inch in 3 feet.
3. Align rails so variations from level for horizontal members and variations from parallel with rake of steps and ramps for sloping members do not exceed 1/4 inch in 12 feet.

C. Control of Corrosion: Prevent galvanic action and other forms of corrosion by insulating metals and other materials from direct contact with incompatible materials.

1. Coat, with a heavy coat of bituminous paint, concealed surfaces of aluminum that are in contact with grout, concrete, masonry, wood, or dissimilar metals.

D. Adjust railings before anchoring to ensure matching alignment at abutting joints.

E. Fastening to In-Place Construction: Use anchorage devices and fasteners where necessary for securing railings and for properly transferring loads to in-place construction.

3.2 RAILING CONNECTIONS

A. Welded Connections: Use fully welded joints for permanently connecting railing components. Comply with requirements for welded connections in "Fabrication" Article whether welding is performed in the shop or in the field.

B. Expansion Joints: Install expansion joints at locations indicated but not farther apart than required to accommodate thermal movement. Provide slip-joint internal sleeve extending 2 inches beyond joint on either side, fasten internal sleeve securely to one side, and locate joint within 6 inches of post.

3.3 ANCHORING POSTS

A. Form or core-drill holes not less than 5 inches deep and 3/4 inch larger than OD of post for installing posts in concrete. Clean holes of loose material, insert posts, and fill annular space between post and concrete with nonshrink, nonmetallic grout or anchoring cement, mixed and placed to comply with anchoring material manufacturer's written instructions.

B. Leave anchorage joint exposed with 1/8-inch buildup, sloped away from post.

C. Anchor posts to metal surfaces with oval flanges, angle type, or floor type as required by conditions, connected to posts and to metal supporting members as follows:

3.4 ATTACHING RAILINGS

A. Anchor railing ends at walls with round flanges anchored to wall construction and welded to railing ends.

B. Anchor railing ends to metal surfaces with flanges bolted to metal surfaces and welded to railing ends.

C. Attach railings to wall with wall brackets, except where end flanges are used. Locate brackets as indicated or, if not indicated, at spacing required to support structural loads.

D. Secure wall brackets and railing end flanges to building construction as follows:

1. For concrete and solid masonry anchorage, use drilled-in expansion shields and hanger or lag bolts.
2. For hollow masonry anchorage, use toggle bolts.
3. For wood stud partitions, use hanger or lag bolts set into studs or wood backing between studs. Coordinate with carpentry work to locate backing members.

3.5 ADJUSTING AND CLEANING

A. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas, and repair galvanizing to comply with ASTM A 780/A 780M.

3.6 PROTECTION

A. Protect finishes of railings from damage during construction period with temporary protective coverings approved by railing manufacturer. Remove protective coverings at time of Substantial Completion.

END OF SECTION 055213

SECTION 06 10 00 - ROUGH CARPENTRY

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Framing with dimension lumber.
2. Framing with engineered wood products.
3. Shear wall panels.
4. Wood blocking, cants, and nailers.
5. Wood furring.
6. Plywood backing panels.

B. Related Requirements:
1. Section 061600 "Sheathing" for sheathing, subflooring, and underlayment.

1.2 DEFINITIONS

A. Boards or Strips: Lumber of less than 2 inches nominal size in least dimension.

B. Dimension Lumber: Lumber of 2 inches nominal size or greater but less than 5 inches nominal size in least dimension.

C. Exposed Framing: Framing not concealed by other construction.

D. OSB: Oriented strand board.

1.3 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. For products receiving a waterborne treatment, include statement that moisture content of treated materials was reduced to levels specified before shipment to Project site.

B. Fastener Patterns: Full-size templates for fasteners in exposed framing.

C. Shop drawings for the engineered wood members and stairs supported by wood members.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Stack wood products flat with spacers beneath and between each bundle to provide air circulation. Protect wood products 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. Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, comply with the applicable rules of any rules-writing agency certified by the ALSC Board of Review. Grade lumber 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.
3. Dress lumber, S4S, unless otherwise indicated.

B. Maximum Moisture Content of Lumber: 15 percent unless otherwise indicated.

C. 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, as published by manufacturer, shall 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 DIMENSION LUMBER FRAMING

A. Non-Load-Bearing Interior Partitions: Construction or No. 2 grade.

1. Application: Interior partitions not indicated as load bearing.
2. Species:

a. Southern pine or mixed southern pine; SPIB.

B. Load-Bearing Partitions: Construction or No. 2 grade.

1. Application: Exterior walls.
2. Species:

a. Southern pine; SPIB.

C. Ceiling Joists: Construction or No. 2 grade.

D. Joists, Rafters, and Other Framing Not Listed Above: Select Structural No. 2 grade.

1. Species:

a. Southern pine; SPIB.
b. Douglas fir-south; WWPA.

E. Exposed Framing Indicated to Receive a Stained or Natural Finish: Hand-select material for uniformity of appearance and freedom from characteristics, on exposed surfaces and edges, that would impair finish appearance, including decay, honeycomb, knot-holes, shake, splits, torn grain, and wane.

1. Species and Grade: Southern pine; Select Structural No. 2 grade; SPIB.
2. Species and Grade: Douglas fir-south; Select Structural No 2 grade; WWPA.

2.3 ENGINEERED WOOD PRODUCTS

A. Source Limitations: Obtain each type of engineered wood product from single source from a single manufacturer.

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.

1. Extreme Fiber Stress in Bending, Edgewise: 2900 psi for 12-inch nominal-depth members.
2. Modulus of Elasticity, Edgewise: 2,200,000 psi.

C. Rim Boards: Product designed to be used as a load-bearing member and to brace wood I-joists at bearing ends, complying with research or evaluation report for I-joists.

1. Manufacturer: Provide products by same manufacturer as I-joists.
2. Material: product made from any combination solid lumber, wood strands, and veneers.
3. Thickness: 1 inch 1-1/8 inches or 1-1/4 inches.
4. Comply with APA PRR-401, rim board grade. Factory mark rim boards with APA-EWS trademark indicating thickness, grade, and compliance with APA-EWS standard.

2.4 SHEAR WALL PANELS

A. Wood-Framed Shear Wall Panels: Prefabricated assembly consisting of wood perimeter framing, tie downs, and Exposure I, Structural I plywood sheathing.

B. Steel-Framed Shear Wall Panels: Prefabricated assembly consisting of cold-formed galvanized-steel panel, steel top and bottom plates, and wood studs.

C. Allowable design loads, as published by manufacturer, shall 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.

2.5 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. Cants.
4. Furring.

B. Dimension Lumber Items: Construction or No. 2 grade lumber of any of the following species:

1. Mixed southern pine or southern pine; SPIB.
2. Douglas fir-south; WWPA.

C. Concealed Boards: 15 percent maximum moisture content and any of the following species and grades:

1. Mixed southern pine or southern pine; No. 2 grade; SPIB.
2. Douglas fir-south; Construction or No. 2 grade; WWPA.

D. 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.

E. 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.

F. 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: Plywood, DOC PS 1, Exposure 1, C-D Plugged, in thickness indicated or, if not indicated, not less than 3/4-inch nominal thickness.

2.7 FASTENERS

A. General: Fasteners shall be of size and type indicated and shall 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

with hot-dip zinc coating complying with ASTM A 153/A 153M or of Type 304 stainless steel.

B. Nails, Brads, and Staples: ASTM F 1667.

C. Power-Driven Fasteners: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC70.

D. Post-Installed Anchors: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on [ICC-ES AC01], [ICC-ES AC58], [ICC-ES AC193], [or] [ICC-ES AC308] as appropriate for the substrate.

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 METAL FRAMING ANCHORS

A. Allowable design loads, as published by manufacturer, shall meet or exceed those of products of manufacturers listed]. 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. Framing anchors shall be punched for fasteners adequate to withstand same loads as framing anchors.

B. Galvanized-Steel Sheet: Hot-dip, zinc-coated steel sheet complying with ASTM A 653/A 653M, G60 (Z180) coating designation.

1. Use for interior locations unless otherwise indicated.

C. Hot-Dip, Heavy-Galvanized Steel Sheet: ASTM A 653/A 653M; structural steel (SS), high-strength low-alloy steel Type A (HSLAS Type A), or high-strength low-alloy steel Type B (HSLAS Type B); G185 (Z550) coating designation; and not less than 0.036 inch (0.9 mm) thick.

D. Stainless-Steel Sheet: ASTM A 666, [Type 304][Type 316].

1. Use for exterior locations and where indicated.

E. Joist Hangers: U-shaped joist hangers with 2-inchlong seat and 1-1/4-inch-wide nailing flanges at least 85 percent of joist depth.

F. Top Flange Hangers: U-shaped joist hangers, full depth of joist, formed from metal strap with tabs bent to extend over and be fastened to supporting member.

1. Strap Width: 1-1/2 inches
2. Thickness: 0.050 inch

G. Bridging: Rigid, V-section, nailless type, 0.050 inch (1.3 mm) thick, length to suit joist size and spacing.

H. Post Bases: Adjustable-socket type for bolting in place with standoff plate to raise post 1 inch (25 mm) above base and with 2-inch-(50-mm-)minimum side cover, socket 0.062 inch (1.6 mm) thick, and standoff and adjustment plates 0.108 inch (2.8 mm) thick.

I. Joist Ties: Flat straps, with holes for fasteners, for tying joists together over supports.

1. Width: 1-1/4 inches
2. Thickness: 0.062 inch
3. Length: As indicated.

J. Rafter Tie-Downs: Bent strap tie for fastening rafters or roof trusses to wall studs below, 1-1/2 inches wide by 0.050 inch thick.

K. Rafter Tie-Downs (Hurricane or Seismic Ties): Bent strap tie for fastening rafters or roof trusses to wall studs below, 2-1/4 inches wide by 0.062 inch thick. Tie fits over top of rafter or truss and fastens to both sides of rafter or truss, face of top plates, and side of stud below.

L. Floor-to-Floor Ties: Flat straps, with holes for fasteners, for tying upper floor wall studs to band joists and lower floor studs, 1-1/4 inches wide by 0.050 inch thick by 36 inches long.

M. Hold-Downs: Brackets for bolting to wall studs and securing to foundation walls with anchor bolts or to other hold-downs with threaded rods and designed with first of two bolts placed seven bolt diameters from reinforced base.

1. Bolt Diameter: As indicated.
2. Width: As indicated.
3. Body Thickness: As indicated.
4. Base Reinforcement Thickness As indicated.

N. Wall Bracing: T-shaped bracing made for letting into studs in saw kerf, 1-1/8 inches wide by 9/16 inch deep by 0.034 inch thick with hemmed edges.

O. Wall Bracing: Angle bracing made for letting into studs in saw kerf, 15/16 by 15/16 by 0.040 inch thick with hemmed edges.

2.9 MISCELLANEOUS MATERIALS

A. Sill-Sealer Gaskets: Glass-fiber-resilient insulation, fabricated in strip form, for use as a sill sealer; 1-inch nominal thickness, compressible to 1/32 inch; selected from manufacturer's standard widths to suit width of sill members indicated.

B. 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. Framing Standard: Comply with AF&PA's WCD 1, "Details for Conventional Wood Frame Construction," unless otherwise indicated.

B. Framing with Engineered Wood Products: Install engineered wood products to comply with manufacturer's written instructions.

C. Set rough carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit rough carpentry accurately to other construction. Locate furring, nailers, blocking, and similar supports to comply with requirements for attaching other construction.

D. Install plywood backing panels by fastening to studs; coordinate locations with utilities requiring backing panels.

E. Install shear wall panels to comply with manufacturer's written instructions.

F. 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 o.c.

J. Sort and select lumber so that natural characteristics do 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. Table 2304.9.1, "Fastening Schedule," in ICC's International Building Code (IBC).

2. ICC-ES evaluation report for fastener.

L. Use steel common nails 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.

3.2 WOOD BLOCKING, AND NAILER INSTALLATION

A. Install where indicated and where required for screeding or 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.

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-size furring horizontally and vertically at 24 inches 600 mm] o.c.

3.4 WALL AND PARTITION FRAMING INSTALLATION

A. General: Provide single bottom plate and double top plates using members of 2-inch nominal thickness whose widths equal that of studs, except single top plate may be used for non-load-bearing partitions. Fasten plates to supporting construction unless otherwise indicated.

1. For exterior walls, provide 2-by-6-inch nominal]size wood studs spaced 16 inches o.c. unless otherwise indicated.
2. For interior partitions and walls, provide2-by-6-inch nominalsize wood studs spaced 16 inches o.c. unless otherwise indicated.
3. Provide continuous horizontal blocking at midheight of partitions more than 96 inches high, using members of 2-inch nominal thickness and of same width as wall or partitions.

B. Construct corners and intersections with three or more studs, except that two studs may be used for interior non-load-bearing partitions.

C. Frame openings with multiple studs and headers. Provide nailed header members of thickness equal to width of studs. Support headers on jamb studs.

1. For non-load-bearing partitions, provide double-jamb studs and headers not less than 4-inch nominal (89-mm actual) depth for openings 48 inches (1200 mm) and less in width, 6-inch nominal (140-mm actual) depth for openings 48 to 72 inches (1200 to 1800 mm) in width, 8-inch nominal (184-mm actual) depth for openings 72 to 120 inches (1800 to 3000 mm) in width, and not less than 10-inch nominal (235-mm actual) depth for openings 10 to 12 feet (3 to 3.6 m) in width.
2. For load-bearing walls, provide double-jamb studs for openings 60 inches (1500 mm) and less in width, and triple-jamb studs for wider openings. Provide headers of depth indicated [or, if not indicated, according to Table R502.5(1) or Table R502.5(2), as applicable, in ICC's International Residential Code for One- and Two-Family Dwellings].

D. Provide diagonal bracing in exterior walls, at locations indicated], at 45-degree angle, full-story height unless otherwise indicated. Use 1-by-4-inch nominal size boards, let-in flush with faces of studs.

3.5 FLOOR JOIST FRAMING INSTALLATION

A. General: Install floor joists with crown edge up and support ends of each member with not less than 1-1/2 inches of bearing on wood or metal, or 3 inches on masonry. Attach floor joists as follows:

1. Where supported on wood members, by toe nailing or by using metal framing anchors.
2. Where framed into wood supporting members, by using wood ledgers as indicated or, if not indicated, by using metal joist hangers.

B. Fire Cuts: At joists built into masonry, bevel cut ends 3 inches and do not embed more than 4 inches

C. Frame openings with headers and trimmers supported by metal joist hangers; double headers and trimmers where span of header exceeds 48 inches

D. Do not notch in middle third of joists; limit notches to one-sixth depth of joist, one-third at ends. Do not bore holes larger than one-third depth of joist; do not locate closer than 2 inches from top or bottom.

E. Provide solid blocking of 2-inch nominal thickness by depth of joist at ends of joists unless nailed to header or band.

F. Lap members framing from opposite sides of beams, girders, or partitions not less than 4 inches or securely tie opposing members together. Provide solid blocking of 2-inch nominal thickness by depth of joist over supports.

G. Anchor members paralleling masonry with 1/4-by-1-1/4-inch metal strap anchors spaced not more than 96 inches o.c., extending over and fastening to three joists. Embed anchors at least 4 inches into grouted masonry with ends bent at right angles and extending 4 inches beyond bend.

H. Provide solid blocking between joists under jamb studs for openings.

I. Under non-load-bearing partitions, provide double joists separated by solid blocking equal to depth of studs above.

1. Provide triple joists separated as above, under partitions receiving ceramic tile and similar heavy finishes or fixtures.

J. Provide bridging of type indicated below, at intervals of 96 inches o.c., between joists.

1. Diagonal wood bridging formed from bevel-cut, 1-by-3-inch nominal-size lumber, double-crossed and nailed at both ends to joists.
2. Steel bridging installed to comply with bridging manufacturer's written instructions.

3.6 CEILING JOIST AND RAFTER FRAMING INSTALLATION

A. Ceiling Joists: Install with crown edge up and complying with requirements specified above for floor joists. Face nail to ends of parallel rafters.

Delete subparagraph below if not applicable. This condition requires subflooring or stringers, as specified, to provide cross-tie.

1. Where ceiling joists are at right angles to rafters, provide additional short joists parallel to rafters from wall plate to first joist; nail to ends of rafters and to top plate, and nail to first joist or anchor with framing anchors or metal straps. Provide 1-by-8-inch nominal size or 2-by-4-inch nominal- size stringers spaced 48 inches o.c. crosswise over main ceiling joists.

B. Rafters: Toe nail or use metal framing anchors. Double rafters to form headers and trimmers at openings in roof framing, if any, and support with metal hangers. Where rafters abut at ridge, place directly opposite each other and nail to ridge member or use metal ridge hangers.

1. At valleys, provide double-valley rafters of size indicated or, if not indicated, of same thickness as regular rafters and 2 inches deeper. Bevel ends of jack rafters for full bearing against valley rafters.
2. At hips, provide hip rafter of size indicated or, if not indicated, of same thickness as regular rafters and 2 inches deeper. Bevel ends of jack rafters for full bearing against hip rafter.

C. Provide collar beams (ties) as indicated or, if not indicated, provide 1-by-6-inch nominal size boards between every third pair of rafters, but not more than 48

inches o.c. Locate below ridge member, at third point of rafter span. Cut ends to fit roof slope and nail to rafters.

D. Provide special framing as indicated for eaves, overhangs, dormers, and similar conditions if any.

3.7 STAIR FRAMING INSTALLATION

A. Provide stair framing members of size, space, and configuration indicated or, if not indicated, to comply with the following requirements:

1. Size: 2-by-12-inch nominal size, minimum.
2. Material: parallel-strand lumber, or solid lumber.
3. Notching: Notch rough carriages to receive treads, risers, and supports; leave at least 3-1/2 inches of effective depth.
4. Spacing: At least three framing members for each 36-inch clear width of stair.

B. Provide stair framing with no more than 3/16-inch variation between adjacent treads and risers and no more than 3/8-inch (variation between largest and smallest treads and risers within each flight.

END OF SECTION 061000

SECTION 061600 - SHEATHING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Wall sheathing.

B. Related Requirements:

1. Section 061000 "Rough Carpentry".
2. Section 072500 "Weather Barriers" for water-resistive barrier applied over wall sheathing.

1.2 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 plywood complies 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 plywood complies with requirements. Include physical properties of treated materials.
3. For fire-retardant treatments, include physical properties of treated plywood both before and after exposure to elevated temperatures, based on testing by a qualified independent testing agency according to ASTM D 5516.
4. For products receiving waterborne treatment, include statement that moisture content of treated materials was reduced to levels specified before shipment to Project site.

1.3 QUALITY ASSURANCE

A. Testing Agency Qualifications: For testing agency providing classification marking for fire-retardant-treated material, an inspection agency acceptable to authorities having jurisdiction that periodically performs inspections to verify that the material bearing the classification marking is representative of the material tested.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Stack panels flat with spacers beneath and between each bundle to provide air circulation. Protect sheathing from weather by covering with waterproof sheeting, securely anchored. Provide for air circulation around stacks and under coverings.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Fire-Resistance Ratings: As tested according to ASTM E 119; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

1. Fire-Resistance Ratings: Indicated by design designations from UL's "Fire Resistance Directory" or from the listings of another qualified testing agency.

2.2 WOOD PANEL PRODUCTS

A. Thickness: As needed to comply with requirements specified, but not less than thickness indicated.

B. Factory mark panels to indicate compliance with applicable standard.

2.3 PRESERVATIVE-TREATED PLYWOOD

A. Preservative Treatment by Pressure Process: AWPA U1; Use Category UC4a.

1. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium.

B. Mark plywood with appropriate classification marking of an inspection agency acceptable to authorities having jurisdiction.

C. Application: Treat all plywood unless otherwise indicated.

2.4 FIRE-RETARDANT-TREATED PLYWOOD

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 as determined by testing identical products per test method indicated by a qualified testing agency.

B. Fire-Retardant-Treated 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 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 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/D 3201M at 92 percent relative humidity. Use where exterior type is not indicated.

C. Kiln-dry material after treatment to a maximum moisture content of 15 percent. Do not use material that is warped or does not comply with requirements for untreated material.

D. Identify fire-retardant-treated plywood with appropriate classification marking of qualified testing agency.

E. Application: Treat all plywood unless otherwise indicated

2.5 WALL SHEATHING

A. Plywood Sheathing: Exposure 1, Structural I sheathing.

1. Span Rating: Not less than 16/0.
2. Nominal Thickness: Not less than 1/2 inch.

2.6 FASTENERS

A. General: Provide fasteners of size and type indicated that comply with requirements specified in this article for material and manufacture.

1. For wall sheathing, provide fasteners with hot-dip zinc coating complying with ASTM A 153/A 153M.

B. Nails, Brads, and Staples: ASTM F 1667.

C. Screws for Fastening Wood Structural Panels to Cold-Formed Metal Framing: ASTM C 954, except with wafer heads and reamer wings, length as recommended by screw manufacturer for material being fastened.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Do not use materials with defects that impair quality of sheathing or pieces that are too small to use with minimum number of joints or optimum joint arrangement. Arrange joints so that pieces do not span between fewer than three support members.

B. Cut panels at penetrations, edges, and other obstructions of work; fit tightly against abutting construction unless otherwise indicated.

C. Securely attach to substrate by fastening as indicated, complying with the following:

1. Table 2304.9.1, "Fastening Schedule," in the ICC's International Building Code.
2. ICC-ES evaluation report for fastener.

D. Coordinate wall sheathing installation with flashing and joint-sealant installation so these materials are installed in sequence and manner that prevent exterior moisture from passing through completed assembly.

E. Do not bridge building expansion joints; cut and space edges of panels to match spacing of structural support elements.

F. Coordinate sheathing installation with installation of materials installed over sheathing so sheathing is not exposed to precipitation or left exposed at end of the workday when rain is forecast.

3.2 WOOD STRUCTURAL PANEL INSTALLATION

A. General: Comply with applicable recommendations in APA Form No. E30, "Engineered Wood Construction Guide," for types of structural-use panels and applications indicated.

B. Fastening Methods: Fasten panels as indicated below:

1. Wall and Roof Sheathing:
   b. Screw to cold-formed metal framing.
   c. Space panels 1/8 inch apart at edges and ends.

END OF SECTION 061600

SECTION 06 20 23 - INTERIOR FINISH CARPENTRY

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Interior trim.

B. Related Requirements:

1. Section 061000 "Rough Carpentry" for furring, blocking, and other carpentry work not exposed to view and for framing exposed to view.
2. Section 099123 "Interior Painting" for priming and backpriming of interior finish carpentry.

1.2 DEFINITIONS

A. MDF: Medium-density fiberboard.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of process and factory-fabricated product. Indicate component materials, dimensions, profiles, textures, and colors 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. Include chemical-treatment manufacturer's written instructions for finishing treated material.
2. Include data for fire-retardant treatment from chemical-treatment manufacturer and certification by treating plant that treated materials comply with requirements.
3. For products receiving a waterborne treatment, include statement that moisture content of treated materials was reduced before shipment to Project site to levels specified.
4. Include copies of warranties from chemical-treatment manufacturers for each type of treatment.

B. Samples for Verification:

1. For each species and cut of lumber and panel products with non-factory-applied finish, with 1/2 of exposed surface finished, 50 sq. in. for lumber and 8 by 10 inches for panels.

2. For each finish system and color of lumber and panel products with factory-applied finish, 50 sq. in. for lumber and 8 by 10 inches for panels.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Stack lumber, plywood, and other panels flat with spacers between each bundle to provide air circulation. Protect materials from weather by covering with waterproof sheeting, securely anchored. Provide for air circulation around stacks and under coverings.

B. Deliver interior finish carpentry materials only when environmental conditions meet requirements specified for installation areas. If interior finish carpentry materials must be stored in other than installation areas, store only where environmental conditions meet requirements specified for installation areas.

1.5 FIELD CONDITIONS

A. Environmental Limitations: Do not deliver or install interior finish carpentry materials until building is enclosed and weatherproof, wet work in space is completed and nominally dry, and HVAC system is operating and maintaining temperature and relative humidity at occupancy levels during the remainder of the construction period.

B. Do not install finish carpentry materials that are wet, moisture damaged, or mold damaged.

1. Indications that materials are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
2. Indications that materials are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

1.6 WARRANTY

A. Manufacturer's Warranty for Columns: Manufacturer agrees to repair or replace columns that fail in materials or workmanship within specified warranty period.

1. Warranty Period for Columns: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

A. Lumber: DOC PS 20 and the following grading rules:

1. NeLMA: Northeastern Lumber Manufacturers' Association, "Standard Grading Rules for Northeastern Lumber."
2. NHLA: National Hardwood Lumber Association, "Rules for the Measurement and Inspection of Hardwood & Cypress."

3. NLGA: National Lumber Grades Authority, "Standard Grading Rules for Canadian Lumber."
4. SPIB: The Southern Pine Inspection Bureau, "Standard Grading Rules for Southern Pine Lumber."
5. WCLIB: West Coast Lumber Inspection Bureau, Standard No. 17, "Grading Rules for West Coast Lumber."
6. WWPA: Western Wood Products Association, "Western Lumber Grading Rules."

B. Factory mark each piece of lumber with grade stamp of inspection agency indicating grade, species, moisture content at time of surfacing, and mill.

1. For exposed lumber, mark grade stamp on end or back of each piece.

2.2 WOOD-PRESERVATIVE-TREATED MATERIALS

A. Preservative Treatment by Pressure Process: AWPA U1; Use Category UC2.

1. Kiln dry lumber and plywood after treatment to a maximum moisture content of 19 and 18 percent respectively.
2. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium.
3. For exposed items indicated to receive transparent finish, do not use chemical formulations that contain colorants or that bleed through or otherwise adversely affect finishes.
4. Do not use material that is warped or does not comply with requirements for untreated material.
5. Mark lumber with treatment-quality mark of an inspection agency approved by the American Lumber Standard Committee's Board of Review.

    a. For exposed lumber indicated to receive a stained or natural finish, mark end or back of each piece.

6. Mark plywood with appropriate classification marking of an inspection agency acceptable to authorities having jurisdiction.

    a. For exposed plywood indicated to receive a stained or natural finish, mark back of each piece.

7. Application: Where indicated.

2.3 INTERIOR TRIM

A. Hardwood Lumber Trim for Transparent Finish (Stain or Clear Finish):

1. Species and Grade: Western red cedar, Clear Heart VG (Vertical Grain) NLGA, WCLIB, or WWPA.
2. Maximum Moisture Content: 13 percent.
3. Finger Jointing: Not allowed.
4. Gluing for Width: Use for lumber trim wider than 6 inches.
5. Veneered Material: Allowed
6. Face Surface: Surfaced

7. Matching: Selected for compatible grain and color.

2.4 MISCELLANEOUS MATERIALS

A. Fasteners for Interior Finish Carpentry: Nails, screws, and other anchoring devices of type, size, material, and finish required for application indicated to provide secure attachment, concealed where possible.

B. Paneling Adhesive: Comply with paneling manufacturer's written recommendations for adhesives.

C. Multipurpose Construction Adhesive: Formulation complying with ASTM D 3498 that is recommended for indicated use by adhesive manufacturer.

2.5 FABRICATION

A. Back out or kerf backs of the following members except those with ends exposed in finished work:

1. Interior standing and running trim except shoe and crown molds.
2. Wood-board paneling.

B. Ease edges of lumber less than 1 inch in nominal thickness to 1/16-inch radius and edges of lumber 1 inch or more in nominal thickness to 1/8-inch radius.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance.

B. Examine finish carpentry materials before installation. Reject materials that are wet, moisture damaged, and mold damaged.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Clean substrates of projections and substances detrimental to application.

B. Before installing interior finish carpentry, condition materials to average prevailing humidity in installation areas for a minimum of 24 hours.

3.3 INSTALLATION, GENERAL

A. Do not use materials that are unsound, warped, improperly treated or finished, inadequately seasoned, too small to fabricate with proper jointing arrangements, or with defective surfaces, sizes, or patterns.

B. Install interior finish carpentry level, plumb, true, and aligned with adjacent materials. Use concealed shims where necessary for alignment.

1. Scribe and cut interior finish carpentry to fit adjoining work. Refinish and seal cuts as recommended by manufacturer.
2. Where face fastening is unavoidable, countersink fasteners, fill surface flush, and sand unless otherwise indicated.
3. Install to tolerance of 1/8 inch in 96 inches for level and plumb. Install adjoining interior finish carpentry with 1/32-inch maximum offset for flush installation and 1/16-inch maximum offset for reveal installation.
4. Coordinate interior finish carpentry with materials and systems in or adjacent to it. Provide cutouts for mechanical and electrical items that penetrate interior finish carpentry.

3.4 STANDING AND RUNNING TRIM INSTALLATION

A. Install with minimum number of joints practical, using full-length pieces from maximum lengths of lumber available. Do not use pieces less than 24 inches long, except where necessary. Stagger joints in adjacent and related standing and running trim. Miter at returns, miter at outside corners, and cope at inside corners to produce tight-fitting joints with full-surface contact throughout length of joint. Use scarf joints for end-to-end joints. Plane backs of casings to provide uniform thickness across joints where necessary for alignment.

1. Match color and grain pattern of trim for transparent finish (stain or clear finish) across joints.
2. Install trim after gypsum-board joint finishing operations are completed.
3. Install without splitting; drill pilot holes before fastening where necessary to prevent splitting. Fasten to prevent movement or warping. Countersink fastener heads on exposed carpentry work and fill holes.

3.5 ADJUSTING

A. Replace interior finish carpentry that is damaged or does not comply with requirements. Interior finish carpentry may be repaired or refinished if work complies with requirements and shows no evidence of repair or refinishing. Adjust joinery for uniform appearance.

3.6 CLEANING

A. Clean interior finish carpentry on exposed and semiexposed surfaces. Restore damaged or soiled areas and touch up factory-applied finishes, if any.

3.7 PROTECTION

A. Protect installed products from damage from weather and other causes during construction.

B. Remove and replace finish carpentry materials that are wet, moisture damaged, and mold damaged.

1. Indications that materials are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
2. Indications that materials are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

END OF SECTION 062023

SECTION 07 21 00 - THERMAL INSULATION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Glass-fiber blanket insulation.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

1.3 INFORMATIONAL SUBMITTALS

A. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for each product.

1.4 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.

1.5 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.

PART 2 - PRODUCTS

2.1 GLASS FIBER BLANKET INSULATION

A. Faced, Glass-Fiber Blanket Insulation: ASTM C 665, Type III (blankets with reflective membrane facing); consisting of fibers; with maximum flame-spread and smoke-developed indexes of 25 or kess, respectively, per ASTM E 84; passing ASTM E 136 for combustion characteristics.

PART 3 - EXECUTION

3.1 PREPARATION

A. Clean substrates of substances that are harmful to insulation or that interfere with insulation attachment.

3.2 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.

3.3 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. Glass-Fiber 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 clearance of insulation around recessed lighting fixtures not rated for or protected from contact with insulation.
4. For wood-framed construction, install blankets according to ASTM C 1320 and as follows:

    a. With faced blankets having stapling flanges, secure insulation by inset, stapling flanges to sides of framing members.
    b. With faced blankets having stapling flanges, lap blanket flange over flange of adjacent blanket to maintain continuity of vapor retarder once finish material is installed over it.

3.4 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 072119 - FOAMED-IN-PLACE INSULATION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Closed-cell spray polyurethane foam.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

1.3 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: An authorized representative who is trained and approved by manufacturer.

PART 2 - PRODUCTS

2.1 CLOSED-CELL SPRAY POLYURETHANE FOAM

A. Closed-Cell Spray Polyurethane Foam: ASTM C 1029, Type II, minimum density of 1.5 lb/cu. ft. and minimum aged R-value at 1-inch thickness of 6.2 deg F x h x sq. ft./Btu at 75 deg F .

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. DiversiFoam Products
b. Dow Chemical Company
c. Owens Corning

2. Surface-Burning Characteristics: Comply with ASTM E 84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

a. Flame-Spread Index: 25 or less.
b. Smoke-Developed Index: 450 or less.

3. Fire Propagation Characteristics: Passes NFPA 285 testing as part of an approved assembly.

2.2 MISCELLANEOUS MATERIALS

A. Primer: Material recommended by insulation manufacturer where required for adhesion of insulation to substrates.

PART 3 - EXECUTION

3.1 PREPARATION

A. Verify that substrates are clean, dry, and free of substances that are harmful to insulation.

B. Priming: Prime substrates where recommended by insulation manufacturer. Apply primer to comply with insulation manufacturer's written instructions. Confine primers to areas to be insulated; do not allow spillage or migration onto adjoining surfaces.

3.2 INSTALLATION

A. Comply with insulation manufacturer's written instructions applicable to products and applications.

B. Spray insulation to envelop entire area to be insulated and fill voids.

C. Apply in multiple passes to not exceed maximum thicknesses recommended by manufacturer. Do not spray into rising foam.

D. Cavity Walls: Install into cavities to fully fill void as indicated on Drawings.

3.3 PROTECTION

A. Protect installed insulation from damage due to harmful weather exposures, physical abuse, and other causes.

END OF SECTION 072119

SECTION 072500 - WEATHER BARRIERS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Flexible flashing.

B. Related Requirements:

1. Section 061600 "Sheathing".

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. For building wrap, include data on air and water-vapor permeance based on testing according to referenced standards.

PART 2 - PRODUCTS

2.1 MISCELLANEOUS MATERIALS

A. Butyl rubber, Flexible Flashing: Composite, self-adhesive, flashing product consisting of a pliable, butyl rubber compound, bonded to a high-density polyethylene film, aluminum foil, or spunbonded polyolefin to produce an overall thickness of not less than 0.025 inch.

1. Products to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

a. GCP Applied Technologies Inc. (formerly Grace Construction Products); Vycor Butyl Self Adhered Flashing.
b. Protecto Wrap Company; BT-25 XL.
c. Raven Industries, Inc; Fortress Flashshield.

B. Primer for Flexible Flashing: Product recommended by manufacturer of flexible flashing for substrate.

C. Nails and Staples: ASTM F 1667.

PART 3 - EXECUTION

3.1 FLEXIBLE FLASHING INSTALLATION

A. Apply flexible flashing where indicated to comply with manufacturer's written instructions.

1. Prime substrates as recommended by flashing manufacturer.
2. Lap seams and junctures with other materials at least 4 inches except that at flashing flanges of other construction, laps need not exceed flange width.
3. Lap flashing over water-resistive barrier at bottom and sides of openings.
4. Lap water-resistive barrier over flashing at heads of openings.
5. After flashing has been applied, roll surfaces with a hard rubber or metal roller to ensure that flashing is completely adhered to substrates.

END OF SECTION 072500

SECTION 079200 - JOINT SEALANTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Silicone joint sealants.
2. Urethane joint sealants.
3. Latex joint sealants.

1.2 SUBMITTALS

A. Product Data: For each joint-sealant product indicated.

1.3 QUALITY ASSURANCE

A. Source Limitations: Obtain each kind of joint sealant from single source from single manufacturer.

B. 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.

1.4 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.
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.

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. VOC Content of Interior Sealants: Provide sealants and sealant primers for use inside the weatherproofing system that comply with the following limits for VOC content when calculated according to 40 CFR 59, Part 59, Subpart D (EPA Method 24):

1. Architectural Sealants: 250 g/L.
2. Sealant Primers for Nonporous Substrates: 250 g/L.
3. Sealant Primers for Porous Substrates: 775 g/L.

C. 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.

D. 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.

E. 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.

2.2 URETHANE JOINT SEALANTS

A. Single-Component, Nonsag, Urethane Joint Sealant: ASTM C 920, Type S, Grade NS, Class 100/50, for Use NT.

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. Sika Corporation, Construction Products Division; Sikaflex - 15LM.
b. Tremco Incorporated; Vulkem 921 or Dymonic FC.

2.3 SILICONE JOINT SEALANTS

A. Single-Component, Nonsag, Neutral-Curing Silicone Joint Sealant: ASTM C 920, Type S, Grade NS, Class 100/50, for Use NT.

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. Dow Corning Corporation; 790.
b. GE Advanced Materials - Silicones; SilPruf LM SCS2700.
c. May National Associates, Inc.; Bondaflex Sil 728 NS.
d. Pecora Corporation; 301 NS.
e. Sika Corporation, Construction Products Division; SikaSil-C990.
f. Tremco Incorporated; Spectrem 1.

B. Mildew-Resistant, Single-Component, Nonsag, Neutral-Curing Silicone Joint Sealant: ASTM C 920, Type S, Grade NS, Class 25, for Use NT.

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. Pecora Corporation; 898.

2.4 LATEX JOINT SEALANTS

A. Latex Joint Sealant: Acrylic latex or siliconized acrylic latex, ASTM C 834, Type OP, Grade NF.

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; Sonolac.
    b. Bostik, Inc.; Chem-Calk 600.
    c. May National Associates, Inc.; Bondaflex 600.
    d. Pecora Corporation; AC-20+.
    e. Schnee-Morehead, Inc.; SM 8200.
    f. Tremco Incorporated; Tremflex 834.

2.5 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.

2.6 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. Stone.
    c. Masonry.

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. Inspect tested joints and report on the following:

1. Whether sealants filled joint cavities and are free of voids.
2. Whether sealant dimensions and configurations comply with specified requirements.
3. 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.

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. Sealant Color, general.

1. Generally use sealant colors matching color of material that joint is located in.
2. Where walls adjoin other materials or trim, use sealants that match the wall color.
3. Where a joint occurs between two materials of differing colors contact Architect for selection.

B. Joint-Sealant Application: Exterior joints in vertical surfaces and horizontal non traffic surfaces:

1. Joint Locations:

a. Construction joints in stone.
b. Control and expansion joints in unit masonry.
c. Joints between different materials listed above.
d. Perimeter joints between materials listed above and frames of doors, windows, and louvers.
e. Other joints as indicated.
f. Urethane Joint Sealant: Single component, nonsag, Class 100/50.

3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.

C. Joint-Sealant Application: Interior joints in vertical surfaces and horizontal nontraffic surfaces.

1. Joint Locations:

a. Construction joints in stone.
b. Control and expansion joints in unit masonry.
c. Joints between different materials listed above.

3. Silicone Joint Sealant: Single component, nonsag, neutral curing, Class 100/50.
4. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.

D. 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.
c. Other joints as indicated.

3. Joint Sealant: Mildew resistant, single component, nonsag, neutral curing, Silicone
4. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.

E. Joint-Sealant Application: Interior joints in vertical surfaces and horizontal nontraffic surfaces.

1. Joint Locations:

a. Perimeter joints between interior wall surfaces and frames of interior doors, casework, windows, trim, and elevator entrances.
b. Other joints as indicated.

3. Joint Sealant: Latex.
4. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.

END OF SECTION 079200

SECTION 084113 - ALUMINUM-FRAMED ENTRANCES AND STOREFRONTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Storefront framing for punched openings.
2. Exterior and interior manual-swing entrance doors and door-frame units.

B. Related Requirements:

1. Section 084126 "All-Glass Entrances and Storefronts" for systems without aluminum support framing.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.

B. Shop Drawings: For aluminum-framed entrances and storefronts. Include plans, elevations, sections, full-size details, and attachments to other work.

1. Include details of provisions for assembly expansion and contraction and for draining moisture occurring within the assembly to the exterior.
2. Include full-size isometric details of each vertical-to-horizontal intersection of aluminum-framed entrances and storefronts, showing the following:

a. Joinery, including concealed welds.
b. Anchorage.
c. Expansion provisions.
d. Glazing.
e. Flashing and drainage.

2. Show connection to and continuity with adjacent thermal, weather, air, and vapor barriers.

C. Samples for Initial Selection: For units with factory-applied color finishes.

1.3 INFORMATIONAL SUBMITTALS

A. Field quality-control reports.

B. Sample Warranties: For special warranties.

1.4 CLOSEOUT SUBMITTALS

A. Maintenance Data: For aluminum-framed entrances and storefronts to include in maintenance manuals.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.

B. Product Options: Information on Drawings and in Specifications establishes requirements for aesthetic effects and performance characteristics of assemblies. Aesthetic effects are indicated by dimensions, arrangements, alignment, and profiles of components and assemblies as they relate to sightlines, to one another, and to adjoining construction.

1. Do not change intended aesthetic effects, as judged solely by Architect, except with Architect's approval. If changes are proposed, submit comprehensive explanatory data to Architect for review.

1.6 WARRANTY

A. Special Warranty: Installer agrees to repair or replace components of aluminum-framed entrances and storefronts that do not comply with requirements or that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Structural failures including, but not limited to, excessive deflection.
b. Noise or vibration created by wind and thermal and structural movements.
c. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
d. Water penetration through fixed glazing and framing areas.
e. Failure of operating components.

2. Warranty Period: 10 years from date of Substantial Completion.

B. Special Finish Warranty: Standard form in which manufacturer agrees to repair finishes or replace aluminum that shows evidence of deterioration of factory-applied finishes within specified warranty period.

1. 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. Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. General Performance: Comply with performance requirements specified, as determined by testing of aluminum-framed entrances and storefronts representing those indicated for this Project without failure due to defective manufacture, fabrication, installation, or other defects in construction.

1. Aluminum-framed entrances and storefronts shall withstand movements of supporting structure including, but not limited to, story drift, twist, column shortening, long-term creep, and deflection from uniformly distributed and concentrated live loads.
2. Failure also includes the following:

a. Thermal stresses transferring to building structure.
b. Glass breakage.
c. Noise or vibration created by wind and thermal and structural movements.
d. Loosening or weakening of fasteners, attachments, and other components.
e. Failure of operating units.

B. Structural Loads:

1. Wind Loads: As indicated on Drawings.

C. Deflection of Framing Members: At design wind pressure, as follows:

1. Deflection Normal to Wall Plane: Limited to edge of glass in a direction perpendicular to glass plane not exceeding 1/175 of the glass edge length for each individual glazing lite.
2. Deflection Parallel to Glazing Plane: Limited to 1/360 of clear span or 1/8 inch, whichever is smaller.

D. Structural: Test according to ASTM E 330 as follows:

1. When tested at 150 percent of positive and negative wind-load design pressures, assemblies, including anchorage, do not evidence material failures, structural distress, or permanent deformation of main framing members exceeding 0.2 percent of span.
2. Test Durations: As required by design wind velocity, but not less than 10 seconds.

E. Air Infiltration: Test according to ASTM E 283 for infiltration as follows:

1. Fixed Framing and Glass Area:

a. Maximum air leakage of 0.06 cfm/sq. ft. at a static-air-pressure differential of 1.57 lbf/sq. ft.

2. Entrance Doors:

a. Pair of Doors: Maximum air leakage of 1.0 cfm/sq. ft. at a static-air-pressure differential of 1.57 lbf/sq. ft.

b. Single Doors: Maximum air leakage of 0.5 cfm/sq. ft. at a static-air-pressure differential of 1.57 lbf/sq. ft.

F. Water Penetration under Static Pressure: Test according to ASTM E 331 as follows:

1. No evidence of water penetration through fixed glazing and framing areas when tested according to a minimum static-air-pressure differential of 20 percent of positive wind-load design pressure, but not less than 6.24 lbf/sq. ft.

G. Energy Performance: Certify and label energy performance according to NFRC as follows:

1. Thermal Transmittance (U-factor): Fixed glazing and framing areas shall have U-factor of not more than 0.45 Btu/sq. ft. x h x deg F as determined according to NFRC 100.
2. Solar Heat Gain Coefficient: Fixed glazing and framing areas shall have a solar heat gain coefficient of no greater than 0.35 as determined according to NFRC 200.
3. Condensation Resistance: Fixed glazing and framing areas shall have an NFRC-certified condensation resistance rating of no less than 15 as determined according to NFRC 500.

H. Noise Reduction: Test according to ASTM E 90, with ratings determined by ASTM E 1332, as follows.

1. Outdoor-Indoor Transmission Class: Minimum 26.

I. Thermal Movements: Allow for thermal movements resulting from ambient and surface temperature changes:

1. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.

2.2 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Kawneer North America.
2. Oldcastle Building Envelope.
3. YKK AP America Inc.

B. Source Limitations: Obtain all components of aluminum-framed entrance and storefront system, including framing and accessories, from single manufacturer.

2.3 FRAMING

A. Framing Members: Manufacturer's extruded- or formed-aluminum framing members of thickness required and reinforced as required to support imposed loads.

1. Construction: Thermally broken.

2. Glazing System: Retained mechanically with gaskets on four sides.
3. Glazing Plane: Front.
4. Finish: Clear anodic finish.
5. Fabrication Method: Field-fabricated stick system.

B. Backer Plates: Manufacturer's standard, continuous backer plates for framing members, if not integral, where framing abuts adjacent construction.

C. Brackets and Reinforcements: Manufacturer's standard high-strength aluminum with nonstaining, nonferrous shims for aligning system components.

D. Materials:

1. Aluminum: Alloy and temper recommended by manufacturer for type of use and finish indicated.

a. Sheet and Plate: ASTM B 209.
b. Extruded Bars, Rods, Profiles, and Tubes: ASTM B 221.
c. Extruded Structural Pipe and Tubes: ASTM B 429/B 429M.
d. Structural Profiles: ASTM B 308/B 308M.

2. Steel Reinforcement: Manufacturer's standard zinc-rich, corrosion-resistant primer complying with SSPC-PS Guide No. 12.00; applied immediately after surface preparation and pretreatment. Select surface preparation methods according to recommendations in SSPC-SP COM, and prepare surfaces according to applicable SSPC standard.

a. Structural Shapes, Plates, and Bars: ASTM A 36/A 36M.
b. Cold-Rolled Sheet and Strip: ASTM A 1008/A 1008M.
c. Hot-Rolled Sheet and Strip: ASTM A 1011/A 1011M.

2.4 ENTRANCE DOOR SYSTEMS

A. Entrance Doors: Manufacturer's standard glazed entrance doors for manual-swing operation.

1. Door Construction: 2- to 2-1/4-inch overall thickness, with minimum 0.125-inch thick, extruded-aluminum tubular rail and stile members. Mechanically fasten corners with reinforcing brackets that are deeply penetrated and fillet welded or that incorporate concealed tie rods.

a. Thermal Construction: High-performance plastic connectors separate aluminum members exposed to the exterior from members exposed to the interior.

2. Door Design: Medium stile; 3-1/2-inch nominal width.

3. Glazing Stops and Gaskets: Beveled, snap-on, extruded-aluminum stops and preformed gaskets.

2.5 ENTRANCE DOOR HARDWARE

A. Entrance Door Hardware: Hardware not specified in this Section is specified in Section 087100 "Door Hardware."

2.6 GLAZING

A. Glazing: Comply with Section 088000 "Glazing."

B. Glazing Gaskets: Manufacturer's standard sealed-corner pressure-glazing system of black, resilient elastomeric glazing gaskets, setting blocks, and shims or spacers.

C. Glazing Sealants: As recommended by manufacturer.

2.7 ACCESSORIES

A. Fasteners and Accessories: Manufacturer's standard corrosion-resistant, nonstaining, nonbleeding fasteners and accessories compatible with adjacent materials.

1. Use self-locking devices where fasteners are subject to loosening or turning out from thermal and structural movements, wind loads, or vibration.
2. Reinforce members as required to receive fastener threads.

B. Anchors: Three-way adjustable anchors with minimum adjustment of 1 inch that accommodate fabrication and installation tolerances in material and finish compatible with adjoining materials and recommended by manufacturer.

1. Concrete and Masonry Inserts: Hot-dip galvanized cast-iron, malleable-iron, or steel inserts complying with ASTM A 123/A 123M or ASTM A 153/A 153M requirements.

C. Concealed Flashing: Manufacturer's standard corrosion-resistant, nonstaining, nonbleeding flashing compatible with adjacent materials Dead-soft, 0.018-inch thick stainless steel, ASTM A 240/A 240M of type recommended by manufacturer.

D. Bituminous Paint: Cold-applied asphalt-mastic paint complying with SSPC-Paint 12 requirements except containing no asbestos, formulated for 30-mil thickness per coat.

2.8 FABRICATION

A. Form or extrude aluminum shapes before finishing.

B. Weld in concealed locations to greatest extent possible to minimize distortion or discoloration of finish. Remove weld spatter and welding oxides from exposed surfaces by descaling or grinding.

C. Fabricate components that, when assembled, have the following characteristics:

1. Profiles that are sharp, straight, and free of defects or deformations.
2. Accurately fitted joints with ends coped or mitered.
3. Physical and thermal isolation of glazing from framing members.

4. Accommodations for thermal and mechanical movements of glazing and framing to maintain required glazing edge clearances.
5. Provisions for field replacement of glazing from [exterior] [interior] [interior for vision glass and exterior for spandrel glazing or metal panels].
6. Fasteners, anchors, and connection devices that are concealed from view to greatest extent possible.

D. Mechanically Glazed Framing Members: Fabricate for flush glazing without projecting stops.

E. Structural-Sealant-Glazed Framing Members: Include accommodations for using temporary support device to retain glazing in place while structural sealant cures.

F. Entrance Door Frames: Reinforce as required to support loads imposed by door operation and for installing entrance door hardware.

G. Entrance Doors: Reinforce doors as required for installing entrance door hardware.

H. Entrance Door Hardware Installation: Factory install entrance door hardware to the greatest extent possible. Cut, drill, and tap for factory-installed entrance door hardware before applying finishes.

I. After fabrication, clearly mark components to identify their locations in Project according to Shop Drawings.

2.9 ALUMINUM FINISHES

A. Clear Anodic Finish: AA-M12C22A41, Class I, 0.018 mm or thicker.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas, 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

A. General:

1. Comply with manufacturer's written instructions.
2. Do not install damaged components.
3. Fit joints to produce hairline joints free of burrs and distortion.
4. Rigidly secure nonmovement joints.
5. Install anchors with separators and isolators to prevent metal corrosion and electrolytic deterioration and to prevent impeding movement of moving joints.
6. Seal perimeter and other joints watertight unless otherwise indicated.

B. Metal Protection:

1. Where aluminum is in contact with dissimilar metals, protect against galvanic action by painting contact surfaces with materials recommended by manufacturer for this purpose or by installing nonconductive spacers.
2. Where aluminum is in contact with concrete or masonry, protect against corrosion by painting contact surfaces with bituminous paint.

C. Set continuous sill members and flashing in full sealant bed as specified in Section 079200 "Joint Sealants" to produce weathertight installation.

D. Install components plumb and true in alignment with established lines and grades.

E. Install operable units level and plumb, securely anchored, and without distortion. Adjust weather-stripping contact and hardware movement to produce proper operation.

F. Install glazing as specified in Section 088000 "Glazing."

G. Entrance Doors: Install doors to produce smooth operation and tight fit at contact points.

1. Exterior Doors: Install to produce weathertight enclosure and tight fit at weather stripping.
2. Field-Installed Entrance Door Hardware: Install surface-mounted entrance door hardware according to entrance door hardware manufacturers' written instructions using concealed fasteners to greatest extent possible.

3.3 ERECTION TOLERANCES

A. Erection Tolerances: Install aluminum-framed entrances and storefronts to comply with the following maximum tolerances:

1. Plumb: 1/8 inch in 10 feet
2. Level: 1/8 inch in 20 feet.
3. Alignment:

   a. Where surfaces abut in line or are separated by reveal or protruding element up to 1/2 inch wide, limit offset from true alignment to 1/16 inch.
   b. Where surfaces are separated by reveal or protruding element from 1/2 to 1 inch wide, limit offset from true alignment to 1/8 inch.
   c. Where surfaces are separated by reveal or protruding element of 1 inch wide or more, limit offset from true alignment to 1/4 inch.

2. Location: Limit variation from plane to 1/8 inch in 12 feet; 1/2 inch over total length.

3.4 FIELD QUALITY CONTROL

A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.

B. Field Quality-Control Testing: Perform the following test on representative areas of aluminum-framed entrances and storefronts.

1. Water-Spray Test: Before installation of interior finishes has begun, areas designated by Architect shall be tested according to AAMA 501.2 and shall not evidence water penetration.

    a. Perform tests in each test area as directed by Architect. Perform at least five tests, prior to 70 percent completion.

C. Aluminum-framed entrances and storefronts will be considered defective if they do not pass tests and inspections.

D. Prepare test and inspection reports.

END OF SECTION 084113

SECTION 092216 - NON-STRUCTURAL METAL FRAMING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Non-load-bearing steel framing systems for interior metal panel wall assemblies.

2. Suspension systems for ceilings, soffits, and grid systems.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Fire-Test-Response Characteristics: For fire-resistance-rated assemblies that incorporate non-load-bearing steel framing, provide materials and construction identical to those tested in assembly indicated, according to ASTM E 119 by an independent testing agency.

2.2 FRAMING SYSTEMS

A. Framing Members, General: Comply with ASTM C 754 for conditions indicated.

1. Steel Sheet Components: Comply with ASTM C 645 requirements for metal unless otherwise indicated.
2. Protective Coating: ASTM A 653/A 653M, G40, hot-dip galvanized unless otherwise indicated.

B. Studs and Runners: ASTM C 645.

1. Steel Studs and Runners:

a. Minimum Base-Metal Thickness: As indicated on Drawings.

1) Depth: As indicated on Drawings.

C. Slip-Type Head Joints: Where indicated, provide the following:

1. Single Long-Leg Runner System: ASTM C 645 top runner with 2-inch- deep flanges in thickness not less than indicated for studs, installed with studs friction fit into top runner and with continuous bridging located within 12 inches of the top of studs to provide lateral bracing.

D. Flat Strap and Backing Plate: Steel sheet for blocking and bracing in length and width indicated.

E. Cold-Rolled Channel Bridging: Steel, 0.053-inch minimum base-metal thickness, with minimum 1/2-inch- wide flanges.

2.3 SUSPENSION SYSTEMS

A. Tie Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, 0.062-inch-diameter wire, or double strand of 0.048-inch- diameter wire.

B. Hanger Attachments to Concrete:

1. Powder-Actuated Fasteners: Suitable for application indicated, fabricated from corrosion-resistant materials with clips or other devices for attaching hangers of type indicated, and capable of sustaining, without failure, a load equal to 10 times that imposed by construction as determined by testing according to ASTM E 1190 by an independent testing agency.

C. Wire Hangers: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, 0.16 inch in diameter.

D. Carrying Channels: Cold-rolled, commercial-steel sheet with a base-metal thickness of 0.053 inch and minimum 1/2-inch- wide flanges.

1. Depth: As indicated on Drawings.

E. Furring Channels (Furring Members):

1. Cold-Rolled Channels: 0.053-inch uncoated-steel thickness, with minimum 1/2-inch- wide flanges, 3/4 inch deep.
2. Steel Studs and Runners: ASTM C 645.

a. Minimum Base-Metal Thickness: As indicated on Drawings.

2.4 SUSPENSION SYSTEMS

A. Tie Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, 0.062-inch diameter wire, or double strand of 0.048-inch diameter wire.

B. Wire Hangers: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, 0.16 inch in diameter.

C. Furring Channels (Furring Members):

1. Steel Studs and Runners: ASTM C 645.

2. Minimum Base-Metal Thickness: As indicated on Drawings.

3. Depth: As indicated on Drawings.

4. Hat-Shaped, Rigid Furring Channels: ASTM C 645, 7/8 inch deep.

5. Minimum Base-Metal Thickness: As indicated on Drawings.

6. Resilient Furring Channels: 1/2-inch- deep members designed to reduce sound transmission.

7. Configuration: Asymmetrical.

D. Grid Suspension System for Gypsum Board Ceilings: ASTM C 645, direct-hung system composed of main beams and cross-furring members that interlock.

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. Armstrong World Industries, Inc.; Drywall Grid Systems.
   b. Chicago Metallic Corporation; Drywall Grid System.
   c. USG Corporation; Drywall Suspension System.

2.5 AUXILIARY MATERIALS

A. General: Provide auxiliary materials that comply with referenced installation standards.

1. Fasteners for Metal Framing: Of type, material, size, corrosion resistance, holding power, and other properties required to fasten steel members to substrates.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas and substrates, with Installer present, and including welded hollow-metal frames, cast-in anchors, and structural framing, for compliance with requirements and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Suspended Assemblies: Coordinate installation of suspension systems with installation of overhead structure to ensure that inserts and other provisions for anchorages to building structure have been installed to receive hangers at spacing required to support the Work and that hangers will develop their full strength.

3.3 INSTALLATION, GENERAL

A. Install supplementary framing, and blocking to support fixtures, equipment services, heavy trim, grab bars, toilet accessories, furnishings, or similar construction.

B. Install bracing at terminations in assemblies.

C. Do not bridge building control and expansion joints with non-load-bearing steel framing members. Frame both sides of joints independently.

3.4 INSTALLING FRAMED ASSEMBLIES

A. Install framing system components according to spacings indicated, but not greater than spacings required by referenced installation standards for assembly types.

1. Single-Layer Application: 16 inches o.c. unless otherwise indicated.

B. Where studs are installed directly against exterior masonry walls or dissimilar metals at exterior walls, install isolation strip between studs and exterior wall.

C. Install studs so flanges within framing system point in same direction.

D. Install tracks (runners) at floors and overhead supports. Extend framing full height to structural supports or substrates above suspended ceilings except where partitions are indicated to terminate at suspended ceilings. Continue framing around ducts penetrating partitions above ceiling.

1. Slip-Type Head Joints: Where framing extends to overhead structural supports, install to produce joints at tops of framing systems that prevent axial loading of finished assemblies.
2. Door Openings: Screw vertical studs at jambs to jamb anchor clips on door frames; install runner track section (for cripple studs) at head and secure to jamb studs.

a. Install two studs at each jamb unless otherwise indicated.

3. Other Framed Openings: Frame openings other than door openings the same as required for door openings unless otherwise indicated. Install framing below sills of openings to match framing required above door heads.
4. Fire-Resistance-Rated Partitions: Install framing to comply with fire-resistance-rated assembly indicated and support closures and to make partitions continuous from floor to underside of solid structure.

E. Installation Tolerance: Install each framing member so fastening surfaces vary not more than 1/8 inch from the plane formed by faces of adjacent framing.

3.5 INSTALLING SUSPENSION SYSTEMS

A. Install suspension system components according to spacings indicated, but not greater than spacings required by referenced installation standards for assembly types.

1. Hangers: 48 inches o.c.
2. Carrying Channels (Main Runners): 48 inches o.c.
3. Furring Channels (Furring Members): 16 inches o.c.

B. Isolate suspension systems from building structure where they abut or are penetrated by building structure to prevent transfer of loading imposed by structural movement.

C. Suspend hangers from building structure as follows:

1. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structural or suspension system.

a. Splay hangers only where required to miss obstructions and offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.

3. Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with locations of hangers required to support standard suspension system members, install supplemental suspension members and hangers in the form of trapezes or equivalent devices.
4. Wire Hangers: Secure by looping and wire tying, either directly to structures or to inserts, eye screws, or other devices and fasteners that are secure and appropriate for substrate, and in a manner that will not cause hangers to deteriorate or otherwise fail.
5. Do not attach hangers to steel roof deck.
6. Do not connect or suspend steel framing from ducts, pipes, or conduit.

D. Grid Suspension Systems: Attach perimeter wall track or angle where grid suspension systems meet vertical surfaces. Mechanically join main beam and cross-furring members to each other and butt-cut to fit into wall track.

E. Installation Tolerances: Install suspension systems that are level to within 1/8 inch in 12 feet measured lengthwise on each member that will receive finishes and transversely between parallel members that will receive finishes.

END OF SECTION 092216

SECTION 092900 - GYPSUM BOARD

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Interior gypsum board.

B. Related Requirements:

1. Section 092216 "Non-Structural Metal Framing" for non-structural framing and suspension systems that support gypsum board panels.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

1.3 DELIVERY, STORAGE AND HANDLING

A. Store materials inside under cover and keep them dry and protected against weather, condensation, direct sunlight, construction traffic, and other potential causes of damage. Stack panels flat and supported on risers on a flat platform to prevent sagging.

1.4 FIELD CONDITIONS

A. Environmental Limitations: Comply with ASTM C 840 requirements or gypsum board manufacturer's written recommendations, whichever are more stringent.

B. Do not install paper-faced gypsum panels until installation areas are enclosed and conditioned.

C. Do not install panels that are wet, those that are moisture damaged, and those that are mold damaged.

1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Fire-Resistance-Rated Assemblies: For fire-resistance-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E 119 by an independent testing agency.

2.2 GYPSUM BOARD, GENERAL

A. Size: Provide maximum lengths and widths available that will minimize joints in each area and that correspond with support system indicated.

2.3 INTERIOR GYPSUM BOARD

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. Certain Teed Corporation
2. Georgia Pacific Gypsum
3. National Gypsum Company
4. USG Corporation

B. Gypsum Board, Type X: ASTM C 1396/C 1396M.

1. Thickness: 5/8 inch .
2. Long Edges: Tapered for prefilling.

2.4 SPECIALTY GYPSUM BOARD

A. Gypsum Board, Type C: ASTM C 1396/C 1396M. Manufactured to have increased fire-resistive capability.

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. Certain Teed Corporation
b. Georgia Pacific Gypsum
c. National Gypsum Company
d. USG Corporation

b. <Insert manufacturer's name; product name or designation>

2. Thickness: 1/2 inch or as required to match existing wall gypsum board thickness.
2. Long Edges: Tapered.

2.5 TRIM ACCESSORIES

A. Interior Trim: ASTM C 1047.

1. Material: [Galvanized or aluminum-coated steel sheet, rolled zinc, plastic, or paper-faced galvanized steel sheet][Galvanized or aluminum-coated steel sheet or rolled zinc][Plastic][Paper-faced galvanized steel sheet].
2. Shapes:

a. Cornerbead.

2.6 JOINT TREATMENT MATERIALS

A. General: Comply with ASTM C 475/C 475M.

B. Joint Tape:

1. Interior Gypsum Board: Paper.

C. Joint Compound for Interior Gypsum Board: For each coat use formulation that is compatible with other compounds applied on previous or for successive coats.

1. Prefilling: At open joints, beveled panel edges, and damaged surface areas, use setting-type taping compound.
2. Embedding and First Coat: For embedding tape and first coat on joints, fasteners, and trim flanges, use drying-type, all-purpose compound.

a. Use setting-type compound for installing paper-faced metal trim accessories.

2. Fill Coat: For second coat, use [setting-type, sandable topping][drying-type, all-purpose] compound.
2. Finish Coat: For third coat, use [setting-type, sandable topping][drying-type, all-purpose] compound.
3. Skim Coat: For final coat of Level 5 finish, use [setting-type, sandable topping compound][drying-type, all-purpose compound][high-build interior coating product designed for application by airless sprayer and to be used instead of skim coat to produce Level 5 finish].

2.7 AUXILIARY MATERIALS

A. General: Provide auxiliary materials that comply with referenced installation standards and manufacturer's written recommendations.

B. Steel Drill Screws: ASTM C 1002, unless otherwise indicated.

1. Use screws complying with ASTM C 954 for fastening panels to steel members from 0.033 to 0.112 inch thick.

C. Thermal Insulation: As specified in Section 072100 "Thermal Insulation."

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas and substrates including welded hollow-metal frames and framing, with Installer present, for compliance with requirements and other conditions affecting performance.

B. Examine panels before installation. Reject panels that are wet, moisture damaged, and mold damaged.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 APPLYING AND FINISHING PANELS, GENERAL

A. Comply with ASTM C 840.

B. Install ceiling panels across framing to minimize the number of abutting end joints and to avoid abutting end joints in central area of each ceiling. Stagger abutting end joints of adjacent panels not less than one framing member.

C. Install panels with face side out. Butt panels together for a light contact at edges and ends with not more than 1/16 inch of open space between panels. Do not force into place.

D. Locate edge and end joints over supports, except in ceiling applications where intermediate supports or gypsum board back-blocking is provided behind end joints. Do not place tapered edges against cut edges or ends. Stagger vertical joints on opposite sides of partitions. Do not make joints other than control joints at corners of framed openings.

E. Form control and expansion joints with space between edges of adjoining gypsum panels.

F. Cover both faces of support framing with gypsum panels in concealed spaces (above ceilings, etc.), except in chases braced internally.

1. Unless concealed application is indicated or required for sound, fire, air, or smoke ratings, coverage may be accomplished with scraps of not less than 8 sq. ft. in area.
2. Fit gypsum panels around ducts, pipes, and conduits.
3. Where partitions intersect structural members projecting below underside of floor/roof slabs and decks, cut gypsum panels to fit profile formed by structural members; allow 1/4- to 3/8-inch-wide joints to install sealant.

G. Isolate perimeter of gypsum board applied to non-load-bearing partitions at structural abutments, except floors. Provide 1/4- to 1/2-inch-wide spaces at these locations and trim edges with edge trim where edges of panels are exposed. Seal joints between edges and abutting structural surfaces with acoustical sealant.

H. Attachment to Steel Framing: Attach panels so leading edge or end of each panel is attached to open (unsupported) edges of stud flanges first.

3.3 APPLYING INTERIOR GYPSUM BOARD

A. Install interior gypsum board in the following locations:

1. Wallboard Type: Vertical surfaces unless otherwise indicated.
2. Type X: Where required to match the existing gypsum board wall thickness of 5/8 inch.
3. Type C: Where required to match the existing gypsum board wall thickness of 1/2 inch.

B. Single-Layer Application:

1. On ceilings, apply gypsum panels before wall/partition board application to greatest extent possible and at right angles to framing unless otherwise indicated.
2. On partitions/walls, apply gypsum panels horizontally (perpendicular to framing) unless otherwise indicated or required by fire-resistance-rated assembly, and minimize end joints.

    a. Stagger abutting end joints not less than one framing member in alternate courses of panels.

2. On Z-furring members, apply gypsum panels vertically (parallel to framing) with no end joints. Locate edge joints over furring members.
2. Fastening Methods: Apply gypsum panels to supports with steel drill screws.

3.4 INSTALLING TRIM ACCESSORIES

A. General: For trim with back flanges intended for fasteners, attach to framing with same fasteners used for panels. Otherwise, attach trim according to manufacturer's written instructions.

B. Interior Trim: Install in the following locations:

1. Cornerbead: Use at outside corners unless otherwise indicated.

3.5 FINISHING GYPSUM BOARD

A. General: Treat gypsum board joints, interior angles, edge trim, control joints, penetrations, fastener heads, surface defects, and elsewhere as required to prepare gypsum board surfaces for decoration. Promptly remove residual joint compound from adjacent surfaces.

B. Prefill open joints, beveled edges, and damaged surface areas.

C. Apply joint tape over gypsum board joints, except for trim products specifically indicated as not intended to receive tape.

D. Gypsum Board Finish Levels: Finish panels to levels indicated below and according to ASTM C 840:

1. Level 4: At panel surfaces that will be exposed to view unless otherwise indicated.

    a. Primer and its application to surfaces are specified in Section 099123 "Interior Painting."

3.6 PROTECTION

A. Protect adjacent surfaces from drywall compound and promptly remove from floors and other non-drywall surfaces. Repair surfaces stained, marred, or otherwise damaged during drywall application.

B. Protect installed products from damage from weather, condensation, direct sunlight, construction, and other causes during remainder of the construction period.

C. Remove and replace panels that are wet, moisture damaged, and mold damaged.

1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

END OF SECTION 092900

SECTION 095123 - ACOUSTICAL TILE CEILINGS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Acoustical tiles for ceilings.
2. Concealed suspension systems.

B. Products furnished, but not installed under this Section, include anchors, clips, and other ceiling attachment devices to be cast in concrete.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Samples for Verification: For each component indicated and for each exposed finish required, prepared on Samples of size indicated below.

1. Acoustical Tile: Set of full-size Samples of each type, color, pattern, and texture.
2. Concealed Suspension-System Members: 6-inch- long Sample of each type.
3. Exposed Moldings and Trim: Set of 6-inch- long Samples of each type and color.

1.3 CLOSEOUT SUBMITTALS

A. Maintenance Data: For finishes to include in maintenance manuals.

1.4 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Acoustical Ceiling Units: One un-opened box of full-size tiles.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver acoustical tiles, suspension-system components, and accessories to Project site in original, unopened packages and store them in a fully enclosed, conditioned space where they will be protected against damage from moisture, humidity, temperature extremes, direct sunlight, surface contamination, and other causes.

B. Before installing acoustical tiles, permit them to reach room temperature and a stabilized moisture content.

C. Handle acoustical tiles carefully to avoid chipping edges or damaging units in any way.

1.6 FIELD CONDITIONS

A. Environmental Limitations: Do not install acoustical tile ceilings until spaces are enclosed and weatherproof, wet work in spaces is complete and dry, work above ceilings is complete, and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Surface-Burning Characteristics: Comply with ASTM E 84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

1. Flame-Spread Index: Comply with ASTM E 1264 for Class A materials.
2. Smoke-Developed Index: 50 or less.

2.2 ACOUSTICAL TILES, GENERAL

A. Source Limitations:

1. Acoustical Ceiling Tile: Obtain each type from single source from single manufacturer.
2. Suspension System: Obtain each type from single source from single manufacturer.

B. Source Limitations: Obtain each type of acoustical ceiling tile and supporting suspension system from single source from single manufacturer.

C. Acoustical Tile Standard: Provide manufacturer's standard tiles of configuration indicated that comply with ASTM E 1264 classifications as designated by types, patterns, acoustical ratings, and light reflectances unless otherwise indicated.

D. Acoustical Tile Colors and Patterns: Match appearance characteristics indicated for each product type.

1. Where appearance characteristics of acoustical tiles are indicated by referencing pattern designations in ASTM E 1264 and not manufacturers' proprietary product designations, provide products selected by Architect from each manufacturer's full range that comply with requirements indicated for type, pattern, color, light reflectance, acoustical performance, edge detail, and size.

2.3 ACOUSTICAL TILES

A. Basis-of-Design Product: Subject to compliance with requirements, provide Armstrong World Industries, Inc. or comparable product by one of the following:

1. CertainTeed Corp
2. USG Interiors, Inc.; Subsidiary of USG Corporation.

B. Classification: Provide tiles complying with ASTM E 1264 for type, form, and pattern as follows:

1. Basis of Design: Fine Fissured Square Lay-in, as manufactured by Armstrong World Industries.

C. Edge/Joint Detail: Beveled, kerfed and rabbeted, or tongue and grooved, or butt.

D. Thickness: 5/8 inch.

E. Modular Size: 24 by 24 inches

F. Broad Spectrum Antimicrobial Fungicide and Bactericide Treatment: Provide acoustical tiles treated with manufacturer's standard antimicrobial formulation that inhibits fungus, mold, mildew, and gram-positive and gram-negative bacteria and showing no mold, mildew, or bacterial growth when tested according to ASTM D 3273 and evaluated according to ASTM D 3274 or ASTM G 21.

2.4 METAL SUSPENSION SYSTEMS, GENERAL

A. Metal Suspension-System Standard: Provide manufacturer's standard heavy duty metal suspension systems of types, structural classifications, and finishes indicated that comply with applicable requirements in ASTM C 635/C 635M.

B. Attachment Devices: Size for five times the design load indicated in ASTM C 635/C 635M, Table 1, "Direct Hung," unless otherwise indicated. Comply with seismic design requirements.

a. Corrosion Protection: Carbon-steel components zinc plated to comply with ASTM B 633, Class Fe/Zn 5 for Class SC 1 service condition.

C. Wire Hangers, Braces, and Ties: Provide wires complying with the following requirements:

1. Zinc-Coated, Carbon-Steel Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper.
2. Size: Select wire diameter so its stress at three times hanger design load (ASTM C 635/C 635M, Table 1, "Direct Hung") will be less than yield stress of wire, but provide not less than 0.106-inch- diameter wire.

2.5 METAL SUSPENSION SYSTEM

A. Basis-of-Design Product: Subject to compliance with requirements, provide ; Suspension System: Prelude XL 15/16”, white in color or comparable product by one of the following:

1. CertainTeed Corp
2. Chicago Metallic Corporation.
3. USG Interiors, Inc.; Subsidiary of USG Corporation.

B. Direct-Hung, Double-Web Suspension System: Main and cross runners roll formed from and capped with cold-rolled steel sheet, prepainted, electrolytically zinc coated, or hot-dip galvanized according to ASTM A 653/A 653M, G30 coating designation.

1. Structural Classification: Heavy duty system.

2.6 METAL EDGE MOLDINGS AND TRIM

A. Basis-of-Design Product: Subject to compliance with requirements, provide CertainTeed Corp. Wall Angle or comparable product by one of the following:

1. Armstrong World Industries, Inc.
2. USG Interiors, Inc.; Subsidiary of USG Corporation.

B. Edge Moldings and Trim: Where indicated, provide manufacturer's edge trim roll formed from cold-rolled steel sheet, prepainted, electrolytically zinc coated, or hot-dip galvanized according to ASTM A 653/A 653M, G30 coating designation, including splice plates, corner pieces, and attachment and other clips and complying with seismic design requirements and the following:

1. Baked-Enamel or Powder-Coat Finish: Minimum dry film thickness of 1.5 mils. Comply with ASTM C 635/C 635M and coating manufacturer's written instructions for cleaning, conversion coating, and applying and baking finish.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, including structural framing and substrates to which acoustical tile ceilings attach or abut, with Installer present, for compliance with requirements specified in this and other Sections that affect ceiling installation and anchorage and for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Examine acoustical tiles before installation. Reject acoustical tiles that are wet, moisture damaged, or mold damaged.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Measure each ceiling area and establish layout of acoustical tiles to balance border widths at opposite edges of each ceiling. Avoid using less-than-half-width tiles at borders, and comply with layout shown on reflected ceiling plans.

3.3 INSTALLATION OF SUSPENDED ACOUSTICAL TILE CEILINGS

A. General: Install acoustical panel ceilings to comply with ASTM C 636/C 636M and seismic design requirements indicated, according to manufacturer's written instructions and CISCA's "Ceiling Systems Handbook."

B. Suspend ceiling hangers from building's structural members and as follows:

1. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structure or of ceiling suspension system.
2. Splay hangers only where required to miss obstructions; offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.
3. Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with location of hangers at spacings required to support standard suspension-system members, install supplemental suspension members and hangers in form of trapezes or equivalent devices.
4. Secure wire hangers to ceiling suspension members and to supports above with a minimum of three tight turns. Connect hangers directly either to structures or to inserts, eye screws, or other devices that are secure and appropriate for substrate and that will not deteriorate or otherwise fail due to age, corrosion, or elevated temperatures.
5. When steel framing does not permit installation of hanger wires at spacing required, install carrying channels or other supplemental support for attachment of hanger wires.
6. Do not attach hangers to steel deck tabs.
7. Space hangers not more than 48 inches o.c. along each member supported directly from hangers unless otherwise indicated; provide hangers not more than 8 inches from ends of each member.
8. Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced standards and publications.

C. Install edge moldings and trim of type indicated at perimeter of acoustical tile ceiling area and where necessary to conceal edges of acoustical tiles.

1. Screw attach moldings to substrate at intervals not more than 16 inches o.c. and not more than 3 inches from ends, leveling with ceiling suspension system to a tolerance of 1/8 inch in 12 feet. Miter corners accurately and connect securely.
2. Do not use exposed fasteners, including pop rivets, on moldings and trim.

D. Install suspension-system runners so they are square and securely interlocked with one another. Remove and replace dented, bent, or kinked members.

E. Install acoustical tiles in coordination with suspension system and exposed moldings and trim. Place splines or suspension-system flanges into kerfed edges so tile-to-tile joints are closed by double lap of material.

1. Fit adjoining tile to form flush, tight joints. Scribe and cut tile for accurate fit at borders and around penetrations through tile.
2. Hold tile field in compression by inserting leaf-type, spring-steel spacers between tile and moldings, spaced 12 inches o.c.

3.4 CLEANING

A. Clean exposed surfaces of acoustical tile ceilings, including trim and edge moldings. Comply with manufacturer's written instructions for cleaning and touchup of minor finish damage. Remove and replace tiles and other ceiling components that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

END OF SECTION 095123

SECTION 096513 - RESILIENT BASE AND ACCESSORIES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Resilient base.
2. Resilient molding accessories.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Samples: For each exposed product and for each color and texture specified, not less than 12 inches long.

1.3 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Furnish not less than 25 linear feet for every 500 linear feet or fraction thereof, of each type, color, pattern, and size of resilient product installed.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Store resilient products and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by manufacturer, but not less than 50 deg F or more than 90 deg F.

1.5 FIELD CONDITIONS

A. Maintain ambient temperatures within range recommended by manufacturer, but not less than 70 deg F or more than 95 deg F, in spaces to receive resilient products during the following time periods:

1. 48 hours before installation.
2. During installation.
3. 48 hours after installation.

B. After installation and until Substantial Completion, maintain ambient temperatures within range recommended by manufacturer, but not less than 55 deg F or more than 95 deg F.

C. Install resilient products after other finishing operations, including painting, have been completed.

PART 2 - PRODUCTS

2.1 THERMOSET-RUBBER BASE

A. Product Standard: ASTM F 1861, Type TS (rubber, vulcanized thermoset), Group I (solid, homogeneous) as manufactured by Roppe.

1. Style: Roppe 700 series – 193 Black/Brown.
2. Location: Throughout the space unless noted otherwise on the drawings.

B. Thickness: 0.125 inch.

C. Height: 4 inches.

D. Lengths: Cut lengths 48 inches long or coils in manufacturer's standard length.

E. Outside Corners: Preformed.

F. Inside Corners: Preformed.

G. Colors: As selected by Architect from full range of industry colors.

2.2 RUBBER MOLDING ACCESSORY

A. Description: Rubber joiner for tile, transition strips.

B. Colors and Patterns: As selected by Architect from full range of industry colors.

2.3 INSTALLATION MATERIALS

A. Trowelable Leveling and Patching Compounds: Latex-modified, portland cement based or blended hydraulic-cement-based formulation provided or approved by resilient-product manufacturer for applications indicated.

B. Adhesives: Water-resistant type recommended by resilient-product manufacturer for resilient products and substrate conditions indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, with Installer present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.

1. Verify that finishes of substrates comply with tolerances and other requirements specified in other Sections and that substrates are free of cracks, ridges, depressions, scale, and foreign deposits that might interfere with adhesion of resilient products.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

1. Installation of resilient products indicates acceptance of surfaces and conditions.

3.2 PREPARATION

A. Prepare substrates according to manufacturer's written instructions to ensure adhesion of resilient products.

B. Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound; remove bumps and ridges to produce a uniform and smooth substrate.

C. Do not install resilient products until they are the same temperature as the space where they are to be installed.

1. At least 48 hours in advance of installation, move resilient products and installation materials into spaces where they will be installed.

D. Immediately before installation, sweep and vacuum clean substrates to be covered by resilient products.

3.3 RESILIENT BASE INSTALLATION

A. Comply with manufacturer's written instructions for installing resilient base.

B. Apply resilient base to walls, columns, pilasters, casework and cabinets in toe spaces, and other permanent fixtures in rooms and areas where base is required.

C. Install resilient base in lengths as long as practical without gaps at seams and with tops of adjacent pieces aligned.

D. Tightly adhere resilient base to substrate throughout length of each piece, with base in continuous contact with horizontal and vertical substrates.

E. Do not stretch resilient base during installation.

F. On masonry surfaces or other similar irregular substrates, fill voids along top edge of resilient base with manufacturer's recommended adhesive filler material.

G. Preformed Corners: Install preformed corners before installing straight pieces.

3.4 RESILIENT ACCESSORY INSTALLATION

A. Comply with manufacturer's written instructions for installing resilient accessories.

B. Resilient Molding Accessories: Butt to adjacent materials and tightly adhere to substrates throughout length of each piece. Install reducer strips at edges of floor covering that would otherwise be exposed.

3.5 CLEANING AND PROTECTION

A. Comply with manufacturer's written instructions for cleaning and protecting resilient products.

B. Perform the following operations immediately after completing resilient-product installation:

1. Remove adhesive and other blemishes from exposed surfaces.
2. Sweep and vacuum horizontal surfaces thoroughly.
3. Damp-mop horizontal surfaces to remove marks and soil.

C. Protect resilient products from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.

D. Cover resilient products subject to wear and foot traffic until Substantial Completion.

END OF SECTION 096513

SECTION 096519 - RESILIENT TILE FLOORING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Vinyl composition floor tile.

1.2 ACTION SUBMITTALS:

A. Samples: (2) Full-size units of each color and pattern of floor tile required.

1.3 QUALITY ASSURANCE

A. Installer Qualifications: A qualified installer who employs workers for this Project who are competent in techniques required by manufacturer for floor tile installation and seaming method indicated.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Store floor tile and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by manufacturer, but not less than 50 deg F or more than 90 deg F. Store floor tiles on flat surfaces.

1.5 FIELD CONDITIONS

A. Maintain ambient temperatures within range recommended by manufacturer, but not less than 70 deg F or more than 95 deg F, in spaces to receive floor tile during the following time periods:

1. 48 hours before installation.
2. During installation.
3. 48 hours after installation.

B. After installation and until Substantial Completion, maintain ambient temperatures within range recommended by manufacturer, but not less than 55 deg F or more than 95 deg F.

C. Close spaces to traffic during floor tile installation.

D. Close spaces to traffic for 48 hours after floor tile installation.

E. Install floor tile after other finishing operations, including painting, have been completed.

PART 2 - PRODUCTS

2.1 VINYL COMPOSITION FLOOR TILE VCT-1

A. Products: Subject to compliance with requirements, provide one of the following:

1. Armstrong World Industries, Inc.
2. Congoleum Corporation.
3. Mannington Mills, Inc.

B. Tile Standard: ASTM F 1066, Class 3, surface-pattern tile.

C. Wearing Surface: Smooth.

D. Thickness: 0.125 inch.

E. Size: 12 by 12 inches.

F. Colors and Patterns: As selected by Architect from full range of industry colors of and patterns.

2.2 INSTALLATION MATERIALS

A. Adhesives: Water-resistant type recommended by floor tile and adhesive manufacturers to suit floor tile and substrate conditions indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, with Installer present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.

1. Verify that finishes of substrates comply with tolerances and other requirements specified in other Sections and that substrates are free of cracks, ridges, depressions, scale, and foreign deposits that might interfere with adhesion of floor tile.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Prepare substrates according to floor tile manufacturer's written instructions to ensure adhesion of resilient products.

B. Concrete Substrates: Prepare according to ASTM F 710.

1. Verify that substrates are dry and free of curing compounds, sealers, and hardeners.
2. Remove substrate coatings and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by floor tile manufacturer. Do not use solvents.

3. Alkalinity and Adhesion Testing: Perform tests recommended by floor tile manufacturer. Proceed with installation only after substrate alkalinity falls within range on pH scale recommended by manufacturer in writing, but not less than 5 or more than 9 pH.
4. Moisture Testing: Proceed with installation only after substrates pass testing according to floor tile manufacturer's written recommendations, but not less stringent than the following:

    a. Perform anhydrous calcium chloride test according to ASTM F 1869. Proceed with installation only after substrates have maximum moisture-vapor-emission rate of 3 lb of water/1000 sq. ft. in 24 hours.
    b. Perform relative humidity test using in situ probes according to ASTM F 2170. Proceed with installation only after substrates have a maximum 75 percent relative humidity level.

C. Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound; remove bumps and ridges to produce a uniform and smooth substrate.

D. Do not install floor tiles until they are the same temperature as the space where they are to be installed.

1. At least 48 hours in advance of installation, move resilient floor tile and installation materials into spaces where they will be installed.

E. Immediately before installation, sweep and vacuum clean substrates to be covered by resilient floor tile.

3.3 FLOOR TILE INSTALLATION

A. Comply with manufacturer's written instructions for installing floor tile.

B. Lay out floor tiles from center marks established with principal walls, discounting minor offsets, so tiles at opposite edges of room are of equal width. Adjust as necessary to avoid using cut widths that equal less than one-half tile at perimeter.

1. Lay tiles square with room axis.

C. Match floor tiles for color and pattern by selecting tiles from cartons in the same sequence as manufactured and packaged, if so numbered. Discard broken, cracked, chipped, or deformed tiles.

1. Lay tiles with grain running in one direction.

D. Scribe, cut, and fit floor tiles to butt neatly and tightly to vertical surfaces and permanent fixtures including built-in furniture, cabinets, pipes, outlets, and door frames.

E. Extend floor tiles into toe spaces, door reveals, closets, and similar openings. Extend floor tiles to center of door openings.

F. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on floor tiles as marked on substrates. Use chalk or other nonpermanent marking device.

G. Adhere floor tiles to flooring substrates using a full spread of adhesive applied to substrate to produce a completed installation without open cracks, voids, raising and puckering at joints, telegraphing of adhesive spreader marks, and other surface imperfections.

3.4 CLEANING AND PROTECTION

A. Comply with manufacturer's written instructions for cleaning and protecting floor tile.

B. Perform the following operations immediately after completing floor tile installation:

1. Remove adhesive and other blemishes from exposed surfaces.
2. Sweep and vacuum surfaces thoroughly.
3. Damp-mop surfaces to remove marks and soil.

C. Protect floor tile from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period. Use a protective covering such as plain, undyed Kraft paper to guard against damage to the new floor.

D. If it becomes necessary to move any heavy fixtures or appliances over the flooring on casters or dollies, the flooring should be protected with 1/4″ or thicker plywood, hardboard or other underlayment panels.

E. Floor Polish: Remove soil, adhesive, and blemishes from floor tile surfaces before applying final wax finish coat.

1. Apply three coats.

F. Cover floor tile until Substantial Completion.

END OF SECTION 096519

SECTION 099113 - EXTERIOR PAINTING

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes surface preparation and the application of paint systems on the following exterior substrates:

1. Wood.
2. Steel.
3. Galvanized metal.

B. Related Requirements:

1. Section 099123 "Interior Painting" for surface preparation and the application of paint systems on interior substrates.

2. Section 099653 “Elastomeric Coatings” for Stucco.

1.2 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 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.

1.3 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Paint: 1 gallon of each material and color applied.

1.4 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.

1. Maintain containers in clean condition, free of foreign materials and residue.
2. Remove rags and waste from storage areas daily.

1.5 FIELD CONDITIONS

A. Apply paints only when temperature of surfaces to be painted and ambient air temperatures are between 50 and 95 deg F.

B. Do not apply paints in snow, rain, fog, or mist; when relative humidity exceeds 85 percent; at temperatures less than 5 deg F above the dew point; or to damp or wet surfaces.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

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. Behr Process Corporation.
2. Benjamin Moore & Co.
3. Dunn-Edwards Corporation.
4. ICI Paints.
5. Kelly-Moore Paints.
6. PPG Architectural Finishes, Inc.
7. Sherwin-Williams Company (The).

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.

D. Colors: As selected by Contracting Officer’s Representative from manufacturer's full range.

2.3 PRIMERS/SEALERS

A. Primer, Bonding, Solvent Based: MPI #69.

2.4 METAL PRIMERS

A. Primer, Alkyd, Anti-Corrosive for Metal::MPI #79.

B. Primer, Galvanized, Water Based: MPI #134.

2.5 WOOD PRIMERS

A. Primer, Oil for Exterior Wood: MPI #7.

2.6 SOLVENT-BASED PAINTS

A. Alkyd, Exterior, Semi-Gloss (Gloss Level 5): MPI #94.

B. Alkyd, Exterior Gloss (Gloss Level 6): MPI #9.

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. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers.

C. 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.

D. Steel Substrates: Remove rust, loose mill scale, and shop primer if any. Clean using methods recommended in writing by paint manufacturer.

E. 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.

F. 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.

G. New 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.

H. Previously Painted Wood Substrates:

1. Power wash to remove dirt.
2. Scrape and remove loose or peeling paint.
3. Sand surfaces that will be exposed to view, and dust off.
4. Prime edges, ends, faces, undersides, and backsides of wood.
5. After priming, fill holes and imperfections in the finish surfaces with putty or plastic wood filler. Sand smooth when dried.

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. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.
5. 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.

3.4 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 Contracting Officer's Representative, and leave in an undamaged condition.

D. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

3.5 EXTERIOR PAINTING SCHEDULE

1. Concrete Substrates, Traffic Surfaces:

    a. Latex Deck Coating System for concrete deck of canopies for mechanical equipment:
    b. Prime Coat: Same as Topcoat to a thickness of 32 wet mils.
    c. Topcoat: Deck coating, latex to a depth of 32 wet mils.

        1) Lanco Urethanizer RC-994.

2. CMU Substrates:

    a. Elastomeric Coatings as specified in section 09 96 53

3. Steel and Iron Substrates:

    a. Water-Based Light Industrial Coating System
    b. Prime Coat: Primer, rust inhibitive, water based [**MPI #107**].

        1) SW Pro Industrial Pro-Cryl Primer.
    c. Intermediate Coat: Light industrial coating, exterior, water based, matching topcoat.
    d. Topcoat: Light industrial coating, exterior, water based (MPI Gloss Level 3).

1) SW Pro Industrial High Performance Acrylic.

3. Galvanized-Metal Substrates (Hollow Metal Doors & Frames):

a. Acrylic System MPI EXT 5.3B:
b. Prime Coat: Primer, galvanized, cementitious.

1) SW DTM Wash Primer.

c. Intermediate Coat: Exterior, acrylic polyurethane enamel, matching topcoat.
d. Topcoat: SW Acrolon Ultra High Performance Polyurethane (MPI Gloss Level 6).

1) SW Pro Industrial Urethane Alkyd Enamel.

4. Wood Substrates: Wood board siding and wood fences.

a. Wood Stain System:
b. Prime Coat: Primer, stain for exterior wood.

1) TWP 1500 Wood Stain.

c. Topcoat: Exterior Wood Stain.

1) TWP 1500 Wood Stain.

END OF SECTION 099113

SECTION 099123 - INTERIOR PAINTING

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes surface preparation and the application of paint systems on the following interior substrates:

1. Steel.
2. Wood with opaque finish.
3. Galvanized metal.
4. Gypsum board.

B. Related Requirements:

1. Section 099113 "Exterior Painting" for surface preparation and the application of paint systems on exterior substrates.

1.2 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 in each color and gloss of topcoat.

1. Submit Samples on rigid backing, 8 inches square.
2. Label each Sample for location and application area.

1.3 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: 1 gallon of each material and color applied.

1.4 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.

1. Maintain containers in clean condition, free of foreign materials and residue.
2. Remove rags and waste from storage areas daily.

1.5 FIELD CONDITIONS

A. Apply paints only when temperature of surfaces to be painted and ambient air temperatures are between 50 and 95 deg F.

B. Do not apply paints when relative humidity exceeds 85 percent; at temperatures less than 5 deg F above the dew point; or to damp or wet surfaces.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

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. Behr Process Corporation.
2. Benjamin Moore & Co.
3. Dunn-Edwards Corporation.
4. ICI Paints.
5. Kelly-Moore Paints.
6. PPG Architectural Finishes, Inc.
7. Sherwin-Williams Company (The).

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: Products shall comply with VOC limits of authorities having jurisdiction and, for interior paints and coatings applied at Project site, the following VOC limits, exclusive of colorants added to a tint base, when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

1. Flat Paints and Coatings: maximum 50 g/L.
2. Nonflat Paints and Coatings: maximum 50 g/L.
3. Dry-Fog Coatings: maximum 50 g/L.
4. Primers, Sealers, and Undercoaters: maximum 50 g/L.
5. Anticorrosive and Antirust Paints Applied to Ferrous Metals: 250 g/L.
6. Zinc-Rich Industrial Maintenance Primers: 340 g/L.
7. Pretreatment Wash Primers: maximum 50 g/L.
8. Floor Coatings: maximum 50 g/L.
9. Shellacs, Clear: maximum 50 g/L.

10. Shellacs, Pigmented: maximum 50 g/L.

D. Colors: As selected by Contracting Officer's Representative from manufacturer's full range.

2.3 PRIMERS/SEALERS

A. Primer Sealer, Latex, Interior: MPI #50.

B. Primer, Alkali Resistant, Water Based: MPI #3.

2.4 METAL PRIMERS

A. Primer, alkyd, anti-corrosive, for metal, MPI #79.

B. Primer, Galvanized, Water Based: MPI #134.

2.5 WATER-BASED PAINTS

A. Latex, Interior, Flat, (Gloss Level 1): MPI #53.

B. Latex, Interior, Semi-Gloss, (Gloss Level 5): MPI #54.

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. Gypsum Board: 12 percent.

C. Gypsum Board Substrates: Verify that finishing compound is sanded smooth.

D. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers.

E. 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 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 if any.

C. Clean substrates of substances that could impair bond of paints, including dust, dirt, oil, grease, and incompatible paints and encapsulants.

D. Masonry Substrates: Remove efflorescence and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces or mortar joints exceed that permitted in manufacturer's written instructions.

E. Steel Substrates: Remove rust, loose mill scale, and shop primer, if any. Clean using methods recommended in writing by paint manufacturer.

F. 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.

G. Galvanized-Metal Substrates: Remove grease and oil residue from galvanized sheet metal fabricated from coil stock by mechanical methods to produce clean, lightly etched surfaces that promote adhesion of subsequently applied paints.

H. New Wood Substrates:

1. Scrape and clean knots, and apply coat of knot sealer before applying primer.
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.

I. Previously Painted Wood Substrates:

1. Scrape to remove loose or peeling paint.
2. Wash down with damp cloth to remove dust and dirt.
3. Sand surfaces that will be exposed to view, and dust off.
4. Prime edges, ends, and faces of wood.
5. After priming, fill holes and imperfections in the finish surfaces with putty or plastic wood filler. Sand smooth when dried.

3.3 APPLICATION

A. Apply paints according to manufacturer's written instructions and to recommendations in "MPI Manual."

1. Use applicators and techniques suited for paint and substrate indicated.

2. Paint surfaces behind movable equipment and furniture same as similar exposed surfaces. Before final installation, paint surfaces behind permanently fixed equipment or furniture with prime coat only.
3. Paint front and backsides of access panels, removable or hinged covers, and similar hinged items to match exposed surfaces.
4. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.
5. Primers specified in painting schedules may be omitted on items that are factory primed or factory finished if acceptable to topcoat manufacturers.

B. If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform paint finish, color, and appearance.

C. 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.

D. Painting Fire Suppression, Plumbing, HVAC, Electrical, Communication, and Electronic Safety and Security Work:

1. Paint the following work where exposed:

a. Equipment, including panelboards.
b. Uninsulated metal piping.
c. Roof deck and structural items.
d. Pipe hangers and supports.
e. Metal conduit.
f. Security bars and frames.
g. Duct, equipment, and pipe insulation having cotton or canvas insulation covering or other paintable jacket material.

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 Contracting Officer's Representative, 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 INTERIOR PAINTING SCHEDULE

A. All interior primers and paints used in occupied areas of the building shall be low order, low VOC.

B. Steel Substrates:

1. Latex over Alkyd Primer System:

a. Prime Coat: Primer, alkyd, anti-corrosive, for metal, MPI #79.
b. Intermediate Coat: Latex, interior, matching topcoat.
c. Topcoat: Latex, interior, semi-gloss, (Gloss Level 5), MPI #54.

C. Galvanized-Metal Substrates:

1. Latex over Waterborne Primer System:

a. Prime Coat: Primer, galvanized, water based, MPI #134.
b. Intermediate Coat: Latex, interior, matching topcoat.
c. Topcoat: Latex, interior, semi-gloss, (Gloss Level 5), MPI #54.

D. Gypsum Board Substrates:

1. Latex System:

a. Prime Coat: Latex, interior, matching topcoat.
b. Topcoat: Latex, interior, flat, (Gloss Level 1), MPI #53

E. Previously Painted Wood Substrates:

1. Latex System:

a. Scrape to remove loose or peeling paint.
b. Wash down with damp cloth to remove dust and dirt.
c. Lightly sand.
d. Prime Coat: Latex, interior, matching topcoat.
e. Topcoat: Latex, interior, Semi-Gloss, (Gloss Level 5): MPI #54.

F. Painted Wood Substrates:

1. Latex System:

a. Prime Coat: Latex, interior, matching topcoat.

b. Topcoat: Latex, interior, Semi-Gloss, (Gloss Level 5): MPI #54.

END OF SECTION 099123

SECTION 099653 - ELASTOMERIC COATINGS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes surface preparation and application of elastomeric coatings to the following exterior substrates:

1. Stucco.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

B. Samples for Initial Selection: For each type of elastomeric coating indicated.

1.3 QUALITY ASSURANCE

A. MPI Standards: Comply with MPI standards indicated and provide elastomeric coatings listed in the "MPI Approved Products List."

1. Preparation and Workmanship: Comply with requirements in the "MPI Architectural Painting Specification Manual" for products and coating systems indicated.

1.4 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 .

1. Maintain containers in clean condition, free of foreign materials and residue.
2. Remove rags and waste from storage areas daily.

1.5 PROJECT CONDITIONS

A. Apply coatings only when temperature of surfaces to be coated and ambient air temperatures are between 50 and 90 deg F unless otherwise permitted by manufacturer's written instructions.

B. Do not apply coatings in snow, rain, fog, or mist; when relative humidity exceeds 85 percent; at temperatures less than 5 deg F above the dew point; or to damp or wet surfaces.

C. Allow wet surfaces to dry thoroughly and attain temperature and conditions specified before starting or continuing coating operation.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

A. Material Compatibility:

1. Provide elastomeric finish coatings and crack fillers, primers, and block fillers as applicable for use within elastomeric finish coatings 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 material or coat, provide products and spreading rates recommended in writing by elastomeric coating manufacturer for use on substrate indicated.

2.2 ELASTOMERIC FINISH COATINGS

A. Exterior Flat Waterborne, Pigmented Elastomeric Coating: MPI #113.

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 Corporation
b. PPG Paints
c. Kelly-Moore Paint Company
d. Sherwin-Williams Company

2. Surface Profile: Match existing soffit texture.
2. VOC Content: 100 g/L or less.
3. Moisture-Vapor Transmission: Meet ASTM D 1653.

2.3 OTHER MATERIALS

A. Crack Fillers: Elastomeric coating manufacturer's recommended, factory-formulated crack fillers or sealants, including crack filler primers, compatible with substrate and other materials indicated; VOC content complying with limits of authorities having jurisdiction.

B. Primer: Elastomeric coating manufacturer's recommended, factory-formulated, alkali-resistant primer compatible with substrate and other materials indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions, with Applicator present, for compliance with manufacturer's requirements for maximum moisture content, alkalinity, and other conditions affecting performance of work.

B. Begin coating only when moisture content of substrate is 12 percent or less when measured with an electronic moisture meter.

C. Begin coating no sooner than 28 days after substrate is constructed and is visually dry on both sides.

D. Verify that substrate is within the range of alkalinity recommended by manufacturer.

E. Verify suitability of substrates including surface conditions and compatibility with existing finishes and primers.

F. Begin coating application only after unsatisfactory conditions have been corrected and surfaces are dry.

3.2 PREPARATION

A. Comply with manufacturer's written instructions and recommendations in the "MPI Architectural Painting Specification Manual" applicable to substrates and coating systems indicated.

B. Remove hardware and hardware accessories, plates, machined surfaces, light fixtures, and similar items already installed that are not to be coated. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and coating.

1. After completing coating operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection if any.

C. Clean substrates of substances that could impair bond of coatings, including dirt, oil, grease, and incompatible paints and encapsulants. Do not coat surfaces if moisture content or alkalinity of surfaces to be coated exceeds that permitted in manufacturer's written instructions.

1. Remove incompatible primers and reprime substrate with compatible primers as required to produce coating systems indicated.
2. Perform cleaning and coating application so dust and other contaminants from cleaning process will not fall on wet, newly coated surfaces.

D. Crack Repair: Fill cracks according to manufacturer's written instructions before coating surfaces.

3.3 APPLICATION

A. Apply elastomeric coatings according to manufacturer's written instructions.

1. Use equipment and techniques best suited for substrate and type of material being applied.
2. Coat surfaces behind movable items the same as similar exposed surfaces.
3. Apply each coat separately according to manufacturer's written instructions.

B. Primers: Apply at a rate to ensure complete coverage.

C. Tint each undercoat a lighter shade to facilitate identification of each coat if multiple coats of same material are to be applied. Tint undercoats similar to color of topcoat, but provide sufficient difference in shade of undercoats to distinguish each separate coat.

D. If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform finish, color, and appearance.

E. Apply coatings 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.

F. Apply coatings to prepared surfaces as soon as practicable after preparation and before subsequent surface soiling or deterioration.

G. Spray Application: Use spray equipment for application only when permitted by authorities having jurisdiction. Wherever spray application is used, do not double back with spray equipment to build up film thickness of two coats in one pass.

3.4 COATING SCHEDULE

A. Stucco Substrates:

1. Primer: Stucco primer if required by manufacturer.
2. Elastomeric Finish Coat(s): Minimum two coats with a total dry film thickness of 16 to 18 mils.
3. Finish-Coat Color: Match existing soffit color.

END OF SECTION 099653

SECTION 220200 - BASIC MATERIALS AND METHODS

PART 1 - GENERAL

1.01 GENERAL REQUIREMENTS

A. The requirements of the General Conditions and Supplementary Conditions apply to all Work herein.

B. The Contract Drawings indicate the extent and general arrangement of the systems. If any departure from the Contract Drawings is deemed necessary by the Contractor, details of such departure and the reasons therefore shall be submitted to the Architect/Engineer for approval as soon as reasonably practicable. No such departures shall be made without the prior written approval of the Architect/Engineer.

C. Notwithstanding any reference in the Specifications to any article, device, product, material, fixture, form or type of construction by name, make or catalog number, such reference shall not be construed as limiting competition; and the Contractor, in such cases, may at his option use any article, device, product, material, fixture, form or type of construction which in the judgment of the Architect/Engineer, expressed in writing, is equal to that specified.

1.02 SCOPE OF WORK

A. The Work included under this Contract consists of the furnishing and installation of all equipment and material necessary and required to form the complete and functioning systems in all of their various phases, all as shown on the accompanying Drawings and/or described in these Specifications. The Contractor shall review all pertinent Drawings, including those of other contracts, prior to commencement of Work.

B. This Division requires the furnishing and installing of all items as specified herein, indicated on the Drawings, or reasonably inferred as necessary for safe and proper operation; including every article, device or accessory (whether or not specifically called for by item) reasonably necessary to facilitate each system's functioning as indicated by the design and the equipment specified. Elements of the work include, but are not limited to: materials, labor, supervision, transportation, storage, equipment, utilities, all required permits, licenses and inspections. All work performed under this Section shall be in accordance with the Project Manual, Drawings and Specifications and is subject to the terms and conditions of the Contract.

C. The approximate locations of Plumbing and Fire Protection items are indicated on the Drawings. These Drawings are not intended to give complete and accurate details with regards to location of outlets, apparatus, etc. Exact locations are to be determined by actual measurements at the building/job-site, and will in all cases be subject to the Review of the Owner or Engineer, who reserves the right to make any reasonable changes in the locations indicated without additional cost to the Owner.

D. Items specifically mentioned in the Specifications but not shown on the Drawings and/or items shown on Drawings but not specifically mentioned in the Specifications shall be installed by the Contractor under the appropriate section of work as if they were both specified and shown.

E. All discrepancies between the Contract Documents and actual job-site conditions shall be reported to the Owner or Engineer so that they will be resolved prior to bidding. Where this cannot be done at least seven (7) working days prior to bid; the greater or more costly of the discrepancy shall be bid. All labor and materials required to perform the work described shall be included as part of this Contract.

F. It is the intention of this Section of the specifications to outline minimum requirements to furnish the Owner with a turn-key and fully operating system in cooperation with other trades.

G. It is the intent of the above "Scope" to give the Contractor a general outline of the extent of the Work involved; however, it is not intended to include each and every item required for the Work. Anything omitted from the "Scope" but shown on the Drawings, or specified elsewhere, or necessary for complete and functioning plumbing systems shall be considered a part of the overall "Scope".

H. The Contractor shall rough-in fixtures and equipment furnished by others from rough-in and placement drawings furnished by others. The Contractor shall make final connection to fixtures and equipment furnished by others.

I. The Contractor shall participate in the Commissioning process as required; including, but not necessarily limited to: meeting attendance, completion of checklists, and participation in functional testing.

1.03 SCHEMATIC NATURE OF CONTRACT DOCUMENTS

A. The contract documents are schematic in nature in that they are only to establish scope and a minimum level of quality. They are not to be used as actual working construction drawings. The actual working construction drawings shall be the reviewed Shop Drawings.

B. All piping, fixture, or equipment locations as indicated on the documents do not indicate every transition, offset, or exact location. All transitions, offsets, clearances and exact locations shall be established by actual field measurements, coordination with the structural, architectural and reflected ceiling plans, and other trades. Submit Shop Drawings for review.

C. All transitions, offsets and relocations as required by actual field conditions shall be performed by the Contractor at no additional cost to the owner.

D. Additional coordination with Electrical Subcontractor may be required to allow adequate clearances of electrical equipment, fixtures, and associated appurtenances. Contractor to notify Architect and Engineer of unresolved clearances, conflicts, or equipment locations.

1.04 SITE VISIT AND FAMILIARIZATION

A. Before submitting a bid, it will be necessary for each Contractor whose work is involved to visit the site and ascertain for himself the conditions to be met therein in installing his work and make due provision for same in his bid. It will be assumed that this Contractor in submitting his bid has visited the premises and that his bid covers all work necessary to properly install the piping, fixtures and equipment shown. Failure on the part of the Contractor to comply with this requirement shall not be considered justification for the omission or faulty installation of any work covered by these Specifications and Drawings.

B. Understand the existing utilities from which services will be supplied; verify locations of utility services, and determine requirements for connections.

C. Determine in advance that equipment and materials proposed for installation fit into the confines indicated.

1.05 WORK SPECIFIED IN OTHER SECTIONS

A. Finish painting is specified. Prime and protective painting is included in the work of this Division.

B. Owner and General Contractor furnished equipment shall be properly connected to plumbing systems.

C. Furnishing and installing all required plumbing equipment, control relays and electrical interlock devices, conduit, wire and junction boxes are included in the Work of this Division.

1.06 PERMITS, TESTS, INSPECTIONS

A. Arrange and pay for all permits, fees, tests, and all inspections as required by governmental authorities.

1.07 DATE OF FINAL ACCEPTANCE

A. The date of final acceptance shall be the date of Owner occupancy, or the date all punch list items have been completed, or the date final payment has been received. Refer to Division 01 for additional requirements.

B. The date of final acceptance shall be documented in writing and signed by the Architect, Owner and Contractor.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to the project properly identified with names, model numbers, types, grades, compliance labels, and other information needed for identification.

B. Deliver products to the project at such times as the project is ready to receive the equipment, pipe or valves - properly protected from incidental damage and weather damage.

C. Damaged equipment, valves or pipe shall be promptly removed from the site and new, undamaged equipment, valves and pipe shall be provided in its place promptly with no additional charge to the Owner.

1.09 NOISE AND VIBRATION

A. The plumbing systems and the component parts thereof shall be guaranteed to operate without objectionable noise and vibration.

B. Provide foundations, supports and isolators as specified or indicated, properly adjusted to prevent transmission of vibration to the building structure, piping and other items.

C. Carefully fabricate pipe and fittings with smooth interior finish to prevent turbulence and generation or regeneration of noise.

D. All equipment shall be selected to operate with minimum of noise and vibration. If, in the opinion of the Architect/Engineer, objectionable noise or vibration is produced or transmitted to or through the building structure by equipment, piping or other parts of the Work, the Contractor shall rectify such conditions without extra cost to the Owner.

1.10 APPLICABLE CODES

A. Obtain all required permits and inspections for all work required by the Contract Documents and pay all required fees in connection thereof.

B. Arrange with the serving utility companies for the connection, relocation, and upgrade of all required utilities and pay all charges, meter charges, connection fees and inspection fees, if required.

C. Comply with all applicable codes, specifications, local ordinances, industry standards, utility company regulations and the applicable requirements of the following nationally accepted codes and standards, including, but not necessarily limited to:

1. American Standards Association, ASA.
2. American Society of Heating, Refrigerating, and Air-Conditioning Engineers, Inc., ASHRAE.
3. American Society of Mechanical Engineers, ASME.
4. American Society of Plumbing Engineers, ASPE.
5. American Society of Testing Materials, ASTM.
6. American Water Works Association, AWWA.
7. National Bureau of Standards, NBS.
8. National Fire Protection Association, NFPA.
9. UL, LLC (formerly Underwriters Laboratories).
10. FM Global.
11. International Energy Conservation Code, IECC.
12. International Fire Code.
13. International Gas Code.

D. Where differences exist between the Contract Documents and applicable state or city building codes, state and local ordinances, industry standards, utility

company regulations and the applicable requirements of the above listed nationally accepted codes and standards, the more stringent or costly application shall govern. Promptly notify the Architect/Engineer in writing of all differences.

E. When directed in writing by the Architect/Engineer, remove all work installed that does not comply with the Contract Documents and applicable state or city building codes, state and local ordinances, industry standards, utility company regulations and the applicable requirements of the above listed nationally accepted codes and standards. Correct the deficiencies and complete the work at no additional cost to the Owner.

1.11 DEFINITIONS AND SYMBOLS

A. General Explanation: A substantial amount of construction and Specification language constitutes definitions for terms found in other Contract Documents, including Drawings which must be recognized as diagrammatic and schematic in nature and not completely descriptive of requirements indicated thereon. Certain terms used in Contract Documents are defined generally in this article, unless defined otherwise in Division 01.

B. Definitions and explanations of this Section are not necessarily either complete or exclusive, but are general for work to the extent not stated more explicitly in another provision of the Contract Documents.

C. Indicated: The term "Indicated" is a cross-reference to details, notes or schedules on the Drawings, to other paragraphs or schedules in the Specifications and to similar means of recording requirements in Contract Documents. Where such terms as "Shown", "Noted", "Scheduled", "Specified" and "Detailed" are used in lieu of "Indicated", it is for the purpose of helping the reader locate cross-reference material, and no limitation of location is intended except as specifically shown.

D. Directed: Where not otherwise explained, terms such as "Directed", "Requested", "Accepted", and "Permitted" mean by the Architect or Engineer. However, no such implied meaning will be interpreted to extend the Architect's or Engineer's responsibility into the Contractor's area of construction supervision.

E. Reviewed: Where used in conjunction with the Engineer's response to submittals, requests for information, applications, inquiries, reports and claims by the Contractor the meaning of the term "Reviewed" will be held to limitations of Architect's and Engineer's responsibilities and duties as specified in the General and Supplemental Conditions. In no case will "Reviewed" by Engineer be interpreted as a release of the Contractor from responsibility to fulfill the terms and requirements of the Contract Documents.

F. Furnish: Except as otherwise defined in greater detail, the term "Furnish" is used to mean supply and deliver new to the project site, ready for unloading, unpacking, assembly, installation, etc., as applicable in each instance.

G. Install: Except as otherwise defined in greater detail, the term "Install" is used to describe operations at the project site including unloading, unpacking,

assembly, erection, placing, anchoring, applying, working to dimension, finishing, curing, protection, cleaning and similar operations, as applicable in each instance.

H. Provide: Except as otherwise defined in greater detail, the term "Provide" is used to mean "Furnish and Install", complete and ready for intended use, as applicable in each instance.

I. Installer: Entity (person or firm) engaged by the Contractor or its Subcontractor for performance of a particular unit of work at the project site, including unloading, unpacking, assembly, erection, placing, anchoring, applying, working to dimension, finishing, curing, protection, cleaning and similar operations, as applicable in each instance. It is a general requirement that such entities (Installers) be expert in the operations they are engaged to perform.

J. Imperative Language: Used generally in Specifications. Except as otherwise indicated, requirements expressed imperatively are to be performed by the Contractor. For clarity of reading at certain locations, contrasting subjective language is used to describe responsibilities that must be fulfilled indirectly by the Contractor, or when so noted by other identified installers or entities.

K. Minimum Quality/Quantity: In every instance, the quality level or quantity shown or specified is intended as minimum quality level or quantity of work to be performed or provided. Except as otherwise specifically indicated, the actual work may either comply exactly with that minimum (within specified tolerances), or may exceed that minimum within reasonable tolerance limits. In complying with requirements, indicated or scheduled numeric values are either minimums or maximums as noted or as appropriate for the context of the requirements. Refer instances of uncertainty to Owner or Engineer via a request for information (RFI) for decision before proceeding.

L. Abbreviations and Symbols: The language of Specifications and other Contract Documents including Drawings is of an abbreviated type in certain instances, and implies words and meanings which will be appropriately interpreted. Actual word abbreviations of a self-explanatory nature have been included in text of Specifications and Drawings. Specific abbreviations and symbols have been established, principally for lengthy technical terminology and primarily in conjunction with coordination of Specification requirements with notations on Drawings and in Schedules. These are frequently defined in Section at first instance of use or on a Legend and Symbol Drawing. Trade and industry association names and titles of generally recognized industry standards are frequently abbreviated. Singular words will be interpreted as plural and plural words will be interpreted as singular where applicable and where full context of Contract Documents so indicate. Except as otherwise indicated, graphic symbols and abbreviations used on Drawings and in Specifications are those recognized in construction industry for indicated purposes. Where not otherwise noted symbols and abbreviations are defined by 2009 ASHRAE Fundamentals Handbook, chapter 34 "Abbreviations and Symbols", ASME and ASPE published standards.

1.12 DRAWINGS AND SPECIFICATIONS

A. These Specifications are intended to supplement the Drawings. It will not be the province of the Specifications to mention any part of the work which the Drawings are competent to fully explain in every particular and such omission shall not to relieve the Contractor from carrying out portions indicated on the Drawings only.

B. Should items be required by these Specifications and not indicated on the Drawings, they are to be supplied even if of such nature that they could have been indicated thereon. In case of disagreement between Drawings and Specifications, or within either Drawings or Specifications, the better quality or greater quantity of work shall be estimated and the matter referred to the Architect or Engineer for review with a request for information and clarification at least seven (7) working days prior to bid opening date for issuance of an addendum.

C. The listing of product manufacturers, materials and methods in the various sections of the Specifications, and indicated on the Drawings, is intended to establish a standard of quality only. It is not the intention of the Owner or Engineer to discriminate against any product, material or method that is equal to the standards as indicated and/or specified, nor is it intended to preclude open, competitive bidding. The fact that a specific manufacturer is listed as an acceptable manufacturer should not be interpreted to mean that the manufacturers' standard product will meet the requirements of the project design, Drawings, Specifications and space constraints.

D. The Architect or Engineer and Owner shall be the sole judge of quality and equivalence of equipment, materials and methods.

E. Products by other reliable manufacturers, other materials, and other methods, will be accepted as outlined, provided they have equal capacity, construction, and performance. However, under no circumstances shall any substitution by made without the written permission of the Architect or Engineer and Owner. Request for prior approval must be made in writing at least ten (10) days prior to the bid date without fail.

F. Wherever a definite product, material or method is specified and there is not a statement that another product, material or method will be acceptable, it is the intention of the Owner or Engineer that the specified product, material or method is the only one that shall be used without prior approval.

G. Wherever a definite material or manufacturer's product is specified and the Specification states that products of similar design and equal construction from the specified list of manufacturers may be substituted, it is the intention of the Owner or Engineer that products of manufacturers that are specified are the only products that will be acceptable and that products of other manufacturers will not be considered for substitution without approval.

H. Wherever a definite product, material or method is specified and there is a statement that "OR EQUAL" product, material or method will be acceptable, it is the intention of the Owner or Engineer that the specified product, material or method or an "OR EQUAL" product, material or method may be used if it complies with the specifications and is submitted for review to the Engineer as outline herein.

I. Where permission to use substituted or alternative equipment on the project is granted by the Owner or Engineer in writing, it shall be the responsibility of the Contractor or Subcontractor involved to verify that the equipment will fit in the space available which includes allowances for all required Code and maintenance clearances, and to coordinate all equipment structural support, plumbing and electrical requirements and provisions with the Mechanical and Plumbing Design Documents and all other trades, including Division 26.

J. Changes in architectural, structural, electrical, mechanical, and plumbing requirements for the substitution shall be the responsibility of the bidder wishing to make the substitution. This shall include the cost of redesign by the affected designer(s). Any additional cost incurred by affected Subcontractors shall be the responsibility of this bidder and not the Owner.

K. If any request for a substitution of product, material or method is rejected, the Contractor will automatically be required to furnish the product, material or method named in the Specifications. Repetitive requests for substitutions will not be considered.

L. The Owner or Engineer will investigate all requests for substitutions when submitted in accordance with above and if accepted, will issue a written acceptance allowing the substitutions.

M. Where equipment other than that used in the design as specified or shown on the Drawings is substituted (either from an approved manufacturers list or by submittal review), it shall be the responsibility of the substituting Contractor to coordinate space requirements, building provisions and connection requirements with his trades and all other trades and pay all additional costs to other trades, the Owner, the Architect or Engineer, if any, due to the substitutions.

1.13 SUBMITTALS

A. Coordinate with Division 01 for submittal timetable requirements, unless noted otherwise within thirty (30) days after the Contract is awarded. The Contractor shall submit an electronic copy of a complete set of Shop Drawings and complete data covering each item of equipment or material. The submittal of each item requiring a submittal must be received by the Architect or Engineer within the above thirty (30) day period. The Architect or Engineer shall not be responsible for any delays or costs incurred due to excessive Shop Drawing review time for submittals received after the thirty (30) day time limit. The Architect and Engineer will retain a copy of all Shop Drawings for their files. All literature pertaining to items subject to Shop Drawing submittal shall be submitted at one time. Submittals shall be placed in one electronic file in PDF 8.0 format and bookmarked for individual specification sections. Individual electronic files of submittals for individual specifications shall not be permitted. Each submittal shall include the following items:

1. A cover sheet with the names and addresses of the Project, Architect, MEP Engineer, General Contractor and the Subcontractor making the submittal. The cover sheet shall also contain the section number

covering the item or items submitted and the item nomenclature or description.

2. An index page with a listing of all data included in the Submittal.
3. A list of variations page with a listing all variations, including unfurnished or additional required accessories, items or other features, between the submitted equipment and the specified equipment. If there are no variations, then this page shall state "NO VARIATIONS". Where variations affect the work of other Contractors, then the Contractor shall certify on this page that these variations have been fully coordinated with the affected Contractors and that all expenses associated with the variations will be paid by the submitting Contractor. This page will be signed by the submitting Contractor.
4. Equipment information including manufacturer's name and designation, size, performance and capacity data as applicable. All applicable Listings, Labels, Approvals and Standards shall be clearly indicated.
5. Dimensional data and scaled drawings as applicable to show that the submitted equipment will fit the space available with all required Code and maintenance clearances clearly indicated and labeled at a minimum scale of 1/4" = 1'-0", as required to demonstrate that the alternate or substituted product will fit in the space available.
6. Identification of each item of material or equipment matching that indicated on the Drawings.
7. Sufficient pictorial, descriptive and diagrammatic data on each item to show its conformance with the Drawings and Specifications. Any options or special requirements or accessories shall be so indicated. All applicable information shall be clearly indicated with arrows or another approved method.
8. Additional information as required in other Sections of this Division.
9. Certification by the General Contractor and Subcontractor that the material submitted is in accordance with the Drawings and Specifications, signed and dated in long hand. Submittals that do not comply with the above requirements shall be returned to the Contractor and shall be marked "REVISE AND RESUBMIT".

B. Refer to Division 00 and Division 01 for additional information on Shop Drawings and submittals.

C. Equipment and materials submittals and Shop Drawings will be reviewed for compliance with design concept only. It will be assumed that the submitting Contractor has verified that all items submitted can be installed in the space allotted. Review of Shop Drawings and submittals shall not be considered as a verification or guarantee of measurements or building conditions.

D. Where Shop Drawings and submittals are marked "REVIEWED", the review of the submittal does not indicate that submittals have been checked in detail nor does it in any way relieve the Contractor from his responsibility to furnish material and perform work as required by the Contract Documents.

E. Shop Drawings shall be reviewed and returned to the Contractor with one of the following categories indicated:

1. REVIEWED: Contractor need take no further submittal action, shall include this submittal in the O&M manual and may order the equipment submitted on.
2. REVIEWED AS NOTED: Contractor shall submit a letter verifying that required exceptions to the submittal have been received and complied with including additional accessories or coordination action as noted, and shall include this submittal and compliance letter in the O&M manual. The Contractor may order the equipment submitted on at the time of the returned submittal providing the Contractor complies with the exceptions noted.
3. NOT APPROVED: Contractor shall resubmit new submittal on material, equipment or method of installation when the alternate or substitute is not approved, the Contractor will automatically be required to furnish the product, material or method named in the Specifications and/or Drawings. Contractor shall not order equipment that is not approved. Repetitive requests for substitutions will not be considered.
4. REVISE AND RESUBMIT: Contractor shall resubmit new submittal on material, equipment or method of installation when the alternate or substitute is marked revise and resubmit, the Contractor will automatically be required to furnish the product, material or method named in the Specifications and/or provide as noted on previous Shop Drawings. Contractor shall not order equipment marked revise and resubmit. Repetitive requests for substitutions will not be considered.
5. CONTRACTOR'S CERTIFICATION REQUIRED: Contractor shall resubmit submittal on material, equipment or method of installation. The Contractor's stamp is required stating the submittal meets all conditions of the contract documents. The stamp shall be signed by the General Contractor. The submittal will not be reviewed if the stamp is not placed and signed on all Shop Drawings.
6. MANUFACTURER NOT AS SPECIFIED: Contractor shall resubmit new submittal on material, equipment or method of installation when the alternate or substitute is marked manufacturer not as specified, the Contractor will automatically be required to furnish the product, material or method named in the specifications. Contractor shall not order equipment where submittal is marked manufacturer not as specified. Repetitive requests for substitutions will not be considered.

F. Materials and equipment which are purchased or installed without Shop Drawing review shall be at the risk of the Contractor and the cost for removal and replacement of such materials and equipment and related work which is judged unsatisfactory by the Owner or Engineer for any reason shall be at the expense of the Contractor. The responsible Contractor shall remove the material and equipment noted above and replace with specified equipment or material at his own expense when directed in writing by the Architect or Engineer.

G. Shop Drawing Submittals shall be complete and checked prior to submission to the Engineer for review.

H. Submittals are required for, but not necessarily limited to, the following items:

1. Basic Materials.

2. Plumbing Fixtures and Valves.
3. Supports and Carriers.
4. Floor Drains, Roof Drains, and Cleanouts.
5. Interceptors/Traps (All Types).
6. Plumbing Piping.
7. Piping, Vessel, and Equipment Insulation.
8. Coordination Drawings.

I. Refer to other Division 22 sections for additional Shop Drawing and submittal requirements. Provide samples of actual materials and/or equipment to be used on the Project upon request of the Owner or Engineer.

1.14 COORDINATION DRAWINGS

A. Prepare coordination drawings to a scale of 1/4"=1'-0" or larger; detailing major elements, components, and systems of plumbing equipment and materials in relationship with other systems, installations, and building components. Indicate locations where space is limited for installation and access and where sequencing and coordination of installations are of importance to the efficient flow of the Work, including (but not necessarily limited to) the following:

1. Indicate the proposed locations of pipe, equipment, and other materials. Include the following:
   a. Wall locations and types.
   b. Clearances for installing and maintaining insulation.
   c. Locations of light fixtures and sprinkler heads.
   d. Clearances for servicing and maintaining equipment, including tube removal and space for equipment disassembly required for periodic maintenance.
   e. Equipment connections and support details.
   f. Exterior wall and foundation penetrations.
   g. Routing of storm, sanitary sewer piping and plumbing piping.
   h. Fire-rated wall and floor penetrations.
   i. Sizes and location of required concrete pads and bases.
   j. Valve stem movement.
   k. Structural floor, wall and roof opening sizes and details.
2. Indicate scheduling, sequencing, movement, and positioning of large equipment into the building during construction.
3. Prepare floor plans, elevations, and details to indicate penetrations in floors, walls, and ceilings and their relationship to other penetrations and installations.

B. This Contractor shall be responsible for coordination of all items that will affect the installation of the work of this Division. This coordination shall include, but not be limited to: voltage, ampacity, capacity, electrical and piping connections, space requirements, sequence of construction, building requirements and special conditions.

C. By submitting Shop Drawings on the project, this Contractor is indicating that all necessary coordination has been completed and that the systems, products and equipment submitted can be installed in the building and will

operate as specified and intended, in full coordination with all other Contractors and Subcontractors.

1.15 RECORD DOCUMENTS

A. Prepare Record Documents in accordance with the requirements of Division 00 and Division 01, in addition to the requirements specified in Division 22.

B. The Contractor shall maintain a separate set of clearly and legibly marked Record Drawings on the job site to record all changes and modifications, including, but not limited to the following: work details, alterations to meet site conditions, and changes made by "Change Order" notices. Mark the drawings with colored pencil(s). These shall be available for review by the Owner, Architect or Engineer during the entire construction stage.

C. The Record Drawings shall be updated concurrently as construction progresses, and in no case less frequently than a daily basis. They shall indicate accurate dimensions for all buried or concealed work; precise locations of all concealed pipe; locations of all valves, controls and operable devices; and any deviations from the work shown on the Construction Documents. All dimensions shall include at least two dimensions to permanent structure points.

D. Record Drawings shall indicate, at a minimum, the following installed conditions:

1. Mains and branches of piping systems, with valves and control devices located and numbered, unions located, and with items requiring maintenance located (i.e., traps, strainers, expansion fittings, tanks, etc.). Valve location diagrams, complete with valve tag chart. Indicate actual inverts and horizontal locations of underground piping.
2. Equipment locations (exposed and concealed), dimensioned from prominent building lines.
3. Approved substitutions, Contract Modifications, and actual equipment and materials installed.
4. Contract Modifications, actual equipment and materials installed.

E. Engage the services of a Land Surveyor or Professional Engineer registered in the state in which the project is located as specified herein to record the locations and invert elevations of underground installations.

F. If the Contractor does not keep an accurate set of Record Documents, the pay request may be altered or delayed at the request of the Architect. Delivery of Record Documents is a condition of final acceptance. Record Drawings shall be furnished in addition to Shop Drawings.

G. Upon completion of the Work, the Contractor shall submit three (3) full size sets of Record Drawing prints to the Architect or Engineer for review prior to scheduling the final inspection at the completion of the work. The drawings shall have the name(s) and seal(s) of the Engineer(s) removed or blanked out and shall be clearly marked and signed on each sheet as follows:

CERTIFIED RECORD DRAWINGS

DATE:

(NAME OF GENERAL CONTRACTOR)

BY:_____
(SIGNATURE)

(NAME OF SUBCONTRACTOR)

BY:_____
(SIGNATURE)

1.16 CERTIFICATIONS AND TEST REPORTS

A. Submit a detailed schedule for completion and testing of each system indicating scheduled dates for completion of system installation and outlining tests to be performed and scheduled dates for each test. This detailed completion and test schedule shall be submittal at least ninety (90) days before the projected Project completion date.

B. Test result reporting forms shall be submitted for review no later than the date of the detailed schedule submitted.

C. Submit four (4) copies of all certifications and test reports to the Architect or Engineer for review adequately in advance of completion of the Work to allow for remedial action as required to correct deficiencies discovered in equipment and systems.

D. Certifications and test reports to be submitted shall include, but not be limited to those items outlined in other Sections of Division 22.

1.17 OPERATIONS AND MAINTENANCE MANUALS

A. Prepare Operations and Maintenance manuals in accordance with the requirements of Division 01 and Division 22. In addition to the requirements of other Sections, this shall include the following information for fixtures, specialties, and equipment items:

1. Identifying names, name tags designations and locations for all equipment.
2. Valve tag lists with valve number, type, color coding, location and function.
3. Reviewed Shop Drawing submittals with exceptions noted compliance letter.
4. Fabrication drawings.
5. Equipment and device bulletins and data sheets clearly highlighted to show equipment installed on the project and including performance curves and data as applicable, i.e., description of function, normal operating characteristics and limitations, performance curves, engineering data and tests, and complete nomenclature and model numbers of replacement parts.

6. Manufacturer's printed operating procedures to include start-up, break-in, and routine and normal operating instructions; regulation, control, stopping, shutdown, and emergency instructions; and summer and winter operating instructions.
7. Maintenance procedures for routine preventative maintenance and troubleshooting; disassembly, repair, and reassembly; aligning and adjusting instructions.
8. Servicing instructions and lubrication charts and schedules.
9. Equipment and motor name plate data.
10. Wiring diagrams.
11. Exploded parts views and parts lists for all equipment and devices.
12. Color coding charts for all painted equipment and conduit.
13. Location and listing of all spare parts and special keys and tools furnished to the Owner.
14. Furnish recommended lubrication schedule for all required lubrication points with listing of type and approximate amount of lubricant required.

B. Coordinate with Division 01 for Operations and Maintenance manual requirements. Unless noted otherwise, bind together in "D ring" style three-ring binders (National model no. 79-883 or equivalent). Binders shall be large enough to allow ¼" of spare capacity. Include three (3) sets with all approved Shop Drawing submittals, fabrication drawings, bulletins, maintenance instructions, operating instructions and parts exploded views and lists for each and every piece of equipment furnished under this Specification. All sections shall be typed and indexed into sections with tabbed insertable dividers, labeled for easy reference. Utilize the individual specification section numbers shown in the Plumbing Specifications as an organization guideline. Bulletins containing information about equipment that is not installed on the project shall be properly marked up or stripped and reassembled. All pertinent information required by the Owner for proper operation and maintenance of equipment supplied by Division 22 shall be clearly and legibly set forth in memoranda that shall, likewise, be bound with bulletins.

C. In addition to the bound "hard-copy" Operation and Maintenance manuals referenced above, provide an identical electronic copy in searchable PDF format, with all sections bookmarked within the file for easy reference. Provide a USB flash drive with the final manual to the Owner.

D. Operating and Maintenance Manuals shall be turned over to the Owner or Engineer for review a minimum of fourteen (14) working days prior to the beginning of the operator training period.

E. Operating and Maintenance Manuals which the Engineer deems incomplete, poorly organized, or otherwise unacceptable will be rejected in writing. The Contractor will subsequently be required to again turn over Operating and Maintenance Manuals, with all deficiencies corrected, until deemed acceptable by the Engineer.

1.18 OPERATOR TRAINING

A. The Contractor shall furnish the services of factory trained specialists to instruct the Owner's operating personnel. The Owner's operator training shall

include a minimum of 12 hours of on- site training in three (3) shifts of four (4) hours each.

B. Before proceeding with the instruction of Owner's Personnel, prepare a typed outline in triplicate, listing the subjects that will be covered in this instruction, and submit the outline for review by the Owner. At the conclusion of the instruction period, obtain the signature of each person being instructed on each copy of the reviewed outline to signify that he or she has a proper understanding of the operation and maintenance of the systems and then resubmit the signed outlines.

C. Refer to other Sections of Division 22 for additional Operator Training requirements.

1.19 FINAL COMPLETION

A. At the completion of the work, all equipment, operable appurtenances, and systems shall be tested. All faulty equipment and material shall be repaired or replaced. Refer to other Sections of Division 22 for additional requirements.

B. Clean and adjust all fixtures, flushometers, valves and operable devices. Replace faulty or otherwise damaged parts immediately prior to final acceptance.

C. Touch up and/or refinish any scratched equipment and devices immediately prior to final acceptance. This shall be acceptable only for minor superficial scratches, the determination of which rests solely on the judgment of the Architect or Engineer.

1.20 CONTRACTOR'S GUARANTEE

A. Use of the Plumbing systems to provide temporary service during the construction period shall not be allowed without written permission from the Owner, and, if granted, shall not be cause for the warranty period to start, except as defined below.

B. Contractor shall guarantee to keep the entire installation in repair and perfect working order for a period of one (1) year after its completion and final acceptance, and shall furnish free of additional cost to the Owner all materials and labor necessary to comply with the above guarantee throughout the year beginning from the date of issue of Substantial Completion, Beneficial Occupancy by the Owner, or the Certificate of Final Payment as agreed upon by all parties.

C. This guarantee shall not include cleaning or changing filters except as required by testing, adjusting and balancing.

D. Refer to other Sections of Division 22 for additional guarantee or warranty requirements.

1.21 TRANSFER OF ELECTRONIC FILES

A. Project documents are not intended or represented to be suitable for re-use by Architect/Owner or others on extensions of this project or on any other project. Any such re-use or modification without written verification or adaptation by Engineer, as appropriate for the specific purpose intended, will be at Architect/Owner's risk and without liability or legal exposure to Engineer or its consultants from all claims, damages, losses and expense, including attorney's fees arising out of or resulting thereof.

B. Because data stored in electric media format can deteriorate or be modified inadvertently, or otherwise without authorization of the data's creator, the party receiving the electronic files agrees that it will perform acceptance tests or procedures within sixty (60) days of receipt, after which time the receiving party shall be deemed to have accepted the data thus transferred to be acceptable. Any errors detected within the sixty (60) day acceptance period will be corrected by the party delivering the electronic files. Engineer is not responsible for maintaining documents stored in electronic media format after acceptance by the Architect/Owner.

C. When transferring documents in electronic media format, Engineer makes no representations as to the long-term compatibility, usability or readability of documents resulting from the use of software application packages, operating systems, or computer hardware differing from those used by Engineer at the beginning of the Project.

D. Any re-use or modifications will be Contractor's sole risk and without liability or legal exposure to Architect, Engineer or any consultant.

E. The Texas Board of Architectural Examiners (TBAE) has stated that it is in violation of Texas law for persons other than the Architect of record to revise the Architectural drawings without the Architect's written consent.

1. It is agreed that "MEP" hard copy or computer-generated documents will not be issued to any other party except directly to the Architect/Owner. The Contract Documents are contractually copyrighted and cannot be used for any other project or purpose except as specifically indicated in AIA B-141 Standard Form of Agreement Between Architect and Owner.
2. If the client, Architect/Owner, or developer of the project requires electronic media for "record purposes", then an AutoCAD based compact disc ("CD") will be prepared. The "CD" will be submitted with all title block references intact and will be formatted in a "plot" format to permit the end user to only view and plot the drawings. Revisions will not be permitted in this configuration.

E. At the Architect/Owner's request, Engineer will prepare one "CD" of electronic media to assist the Contractor in the preparation of submittals. The Engineer will prepare and submit the "CD" to the Architect/Owner for distribution to the Contractor.

1. The "CD" will be prepared and all title blocks, names and dates will be removed. The "CD" will be prepared in a ".dwg" format to permit the end user to revise the drawings.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Provide materials and equipment manufactured by a domestic United States manufacturer and assembled in the United States for all local and Federal Government projects. These materials and equipment shall comply with "Buy American Act."

B. Access Doors: Provide access doors as required for access to equipment, valves, controls, cleanouts and other apparatus where concealed. Access doors shall have concealed hinges and screw driver cam locks unless indicated otherwise.

C. All access panels located in wet areas such as toilet rooms, locker rooms, shower rooms, natatoriums, kitchens, and any other wet areas shall be constructed of stainless steel.

D. Access doors shall be as follows:

1. Plastic Surfaces: Milcor Style K.
2. Ceramic Tile Surfaces: Milcor Style M.
3. Drywall Surfaces: Milcor Style DW.
4. Install panels only in locations approved by the Architect.

2.02 EQUIPMENT PADS

A. Provide four (4) inch high concrete pads for indoor floor mounted equipment. Pads shall conform to the shape of the equipment with a minimum extension of six (6) inches beyond the equipment. Top and sides of pads shall be troweled to a smooth finish, equivalent to the floor. External corners shall be bull-nosed to a 3/4" radius, unless shown otherwise.

B. Provide six (6) inch high concrete pads for all exterior mounted equipment. Pads shall conform to the shape of the equipment with a minimum extension of six (6) inches beyond the equipment. Provide a four (4) foot monolithic extension to the pad in front of the equipment for service when mounted on a non-finished area (i.e. landscape, gravel, clay, etc.) Top and sides of pads shall be troweled to a smooth finish. External corners shall be bull-nosed to a 3/4" radius, unless shown otherwise.

PART 3 - EXECUTION

3.01 ROUGH-IN

A. Verify final locations for rough-ins with field measurements and with the requirements of the actual equipment to be connected via reviewed submittals.

B. Refer to equipment specifications in other Divisions (10, 11, 12, 13, 21, 22, etc.) for additional rough-in requirements as necessary and provide accordingly.

3.02 PLUMBING INSTALLATIONS

A. General: Sequence, coordinate, and integrate the various elements of plumbing and fire systems, materials, and equipment. Comply with the following requirements:

1. Coordinate plumbing and fire protection systems, equipment, and materials installation with other building components.
2. Verify all dimensions by field measurements.
3. Arrange for chases, slots, leave-outs, and other openings in building components during progress of construction to allow for plumbing installations.
4. Coordinate the installation of required supporting devices, sleeves, and pathways to be set in poured-in-place concrete and other structural components, as they are constructed.
5. Sequence, coordinate, and integrate installations of plumbing materials and equipment for efficient flow of the Work. Give particular attention to large equipment requiring positioning prior to closing in the building.
6. Where mounting heights are not detailed or dimensioned, install systems, materials, and equipment to provide the maximum headroom possible.
7. Coordinate connection of plumbing and fire protection systems with exterior underground and overhead utilities and services. Comply with requirements of governing regulations, franchised service companies, and controlling agencies. Provide required connection for each service.
8. Install systems, materials, and equipment to conform with architectural action markings on submittal, including coordination drawings, to greatest extent possible. Conform to arrangements indicated by the Contract Documents, recognizing that portions of the Work are shown only in diagrammatic form. Where coordination requirements conflict with individual system requirements, resolve conflicts and submit proposed solution to the Architect for review.
9. Install systems, materials, and equipment level and plumb, parallel and perpendicular to other building systems and components, where installed exposed in finished spaces.
10. Install equipment to facilitate servicing, maintenance, and repair or replacement of equipment components. As much as practical, connect equipment for ease of disconnecting, with minimum of interference with other installations. Extend grease fittings to an accessible location and label.
11. Install access panels or doors where valves, operable devices, and equipment are concealed behind finished surfaces. Refer to Article 2.01 of this Section and to Architectural documents for specifications and locations.
12. Install systems, materials, and equipment giving right-of-way priority to systems required to be installed at a specified slope.
13. Provide roof curbs for all roof mounted equipment. Coordinate with roof construction for pitched roof. Provide roof curb to match roof slope. Refer to architectural drawings and details.
14. The equipment to be furnished under this Specification shall be essentially the standard product of the manufacturer. Where two or more units of the same class of equipment are required, these units

shall be products of a single manufacturer; however, the component parts of the system need not be the product of the same manufacturer.

15. The architectural and structural features of the building and the space limitations shall be considered in selection of all equipment. No equipment shall be furnished which will not suit the arrangement and space limitations indicated.
16. Lubrication: Prior to start-up, check and properly lubricate all bearings as recommended by the manufacturer.
17. Where the word "Concealed" is used in these Specifications in connection with insulating, painting, piping, valves, etc., it shall be understood to mean hidden from sight as in chases, furred spaces or suspended ceilings. "Exposed" shall be understood to mean the opposite of concealed.
18. Identification of Plumbing Equipment:
    a. Plumbing equipment shall be identified by means of nameplates permanently attached to the equipment. Nameplates shall be engraved laminated plastic or etched metal. Shop Drawings shall include dimensions and lettering format for approval. Attachments shall be with escutcheon pins, self-tapping screws, or machine screws.
    b. Tags shall be attached to all valves, including control valves, with nonferrous chains. Tags shall be brass and at least 1-1/2 inches in diameter. Nameplate and tag symbols shall correspond to the identification symbols on the Record Drawings.

3.03 CUTTING AND PATCHING

A. Protection of Installed Work: During cutting and patching operations, protect adjacent installations.

B. Perform cutting, fitting, and patching of plumbing equipment and materials required to:

1. Uncover Work to provide for installation of ill-timed Work.
2. Remove and replace defective Work.
3. Remove and replace Work not conforming to requirements of the Contract Documents.
4. Remove samples of installed Work as specified for testing.
5. Install equipment and materials in existing structures.
6. Upon written instructions from the Engineer, uncover and restore Work to provide for Engineer/Owner's observation of concealed Work, without additional cost to the Owner.
7. Patch existing finished surfaces and building components using new materials matching existing materials and experienced Installers. Patch finished surfaces and building components using new materials specified for the original installation and experienced Installers; refer to the materials and methods required for the surface and building components being patched; Refer to Article 1.11 DEFINITIONS AND SYMBOLS for definition of "Installer."

C. Cut, remove and legally dispose of selected plumbing equipment, components, and materials as indicated, including but not limited to removal of plumbing piping, equipment, plumbing fixtures and trim, and other plumbing items made obsolete by the new Work.

D. Protect the structure, furnishings, finishes, and adjacent materials not indicated or scheduled to be removed.

E. Provide and maintain temporary partitions or dust barriers adequate to prevent the spread of dust and dirt to adjacent areas.

3.04 WORK SEQUENCE, TIMING, COORDINATION WITH OWNER, ARCHITECT AND ENGINEER

A. The Owner will cooperate with the Contractor, however, the following provisions must be observed:

1. A meeting will be held at the project site, prior to any construction, between the Owner's Representative, the General Contractor, the Subcontractors and the Architect/Engineer to discuss Contractor's employee parking space, access, storage of equipment or materials, and use of the Owner's facilities or utilities. The Owner's decisions regarding such matters shall be final.
2. During the construction of this project, normal facility activities will continue in existing buildings until renovated areas are completed. Plumbing, fire protection, lighting, electrical, communications, heating, air conditioning, and ventilation systems will have to be maintained in service within the occupied spaces of the existing building.

B. Start-up for major plumbing and fire protection equipment shall be performed by a factory authorized technician. Such equipment shall include, but not necessarily be limited to, the following: domestic water boilers and packaged water heating systems, water softeners, ultra-pure water equipment systems, domestic water booster pumps, fire pumps, and break tank level alarm systems. Refer to other Sections of Divisions 21 and 22 for additional requirements.

3.05 DEMOLITION AND WORK WITHIN EXISTING BUILDINGS

A. In the preparation of these documents every effort has been made to show the approximate locations of, and connections to the existing piping, utilities, equipment and other apparatus related to this phase of the work. However, this Contractor shall be responsible for verifying all of the above information. This Contractor shall visit the existing site to inspect the facilities and related areas. This Contractor shall inspect and verify all details and requirements of all the Contract Documents, prior to the submission of a proposal. All discrepancies between the Contract Documents and actual job-site conditions shall be resolved by this Contractor, who shall produce drawings that shall be submitted to the Architect/Engineer for review. All labor and materials required to perform the work described shall be a part of this Contract.

B. All equipment and/or systems noted on the Drawings "To Remain" shall be inspected and tested on site to certify its working condition. A written report

on the condition of all equipment to remain, including a copy of the test results and recommended remedial actions and costs shall be made by this Contractor to the Architect/Engineer for review.

C. All equipment and/or systems noted on the Drawings "To Be Removed" shall be removed including, associated pipe, supports, and hangers. Where pipe is to be capped for future or end of line use, it shall be properly tagged with its function or service appropriately identified. Where existing equipment is to be removed or relocated and has an electric motor or connection, the Electrical Contractor shall disconnect motor or connection, remove wiring to a safe point and this Contractor shall remove or relocate motor or connection along with the equipment.

D. Ensure existing piping and equipment to remain that is adjacent to and impacted by the scope of Work is properly supported, fastened, and secure.

E. During the construction and remodeling, portions of the Project shall remain in service. Construction equipment, material tools, extension cords, etc., shall be arranged so as to present minimum hazard or interruption to the occupants of the building. None of the construction work shall interfere with the proper operation of the existing facility or be so conducted as to cause harm or danger to persons on the premises. All fire exits, stairs or corridors required for proper access, circulation or exit shall remain clear of equipment, materials or debris. The General Contractor shall maintain barricades, other separations in corridors and other spaces where work is conducted.

F. Certain work during the demolition phase of construction may require overtime, night time, or weekend shifts or temporary evacuation of the occupants. Coordinate and schedule all proposed down time with the Owner at least seventy-two (72) hours in advance in writing.

G. Any salvageable equipment as determined by the Owner, shall be delivered to the Owner, and placed in storage at the location of his choice. All other debris shall be removed from the site immediately and disposed of lawfully.

H. Equipment, piping or other potential hazards to the working occupants of the building or the general public shall not be left overnight outside of the designated working or construction area.

I. Make every effort to minimize damage to the existing building and the Owner's property. Repair, patch or replace as required any damage that occurs as a result of work at the site. Care shall be taken to minimize interference with the Owner's activities during construction and to keep construction disrupted areas to a minimum. Coordinate with the Owner and other trades in scheduling and performance of the work.

J. Include in the contract price all rerouting of existing pipe, utilities, etc., and the reconnecting of the existing equipment and plumbing fixtures as necessitated by field conditions to allow the installation of the new systems regardless of whether or not such rerouting, reconnecting or relocating is shown on the Drawings. Provide all temporary pipe, utilities, controls, etc., as required to maintain heating, cooling, ventilation and plumbing services for the existing areas with a minimum of interruption.

K. All existing plumbing fixtures, pipe, utilities, materials, equipment, controls and appurtenances not included in the remodel or alteration areas are to remain in place.

L. Pipe, utilities, equipment and controls serving mechanical, plumbing and owner's equipment, etc., which is to remain but which is served by pipe, utilities, equipment and controls that are disturbed by the remodeling work, shall be reconnected in such a manner as to leave this equipment in proper operating condition.

M. No portion of the fire protection systems shall be turned off, modified or changed in any way without the express knowledge and written permission of the Owner’s representative in order to protect systems that shall remain in service.

N. It is the intention of this Section of the Specifications to outline minimum requirements to furnish the Owner with a turn-key and operating system in cooperation with other trades with a minimum of disruption or downtime.

O. Refer to Architectural Demolition and/or Alteration plans for actual locations of walls, ceiling, etc., being removed and/or remodeled.

END OF SECTION

SECTION 230200 - BASIC MATERIALS AND METHODS

PART 1 - GENERAL

1.01 GENERAL REQUIREMENTS

A. The requirements of the General Conditions and Supplementary Conditions apply to all Work herein.

B. The Contract Drawings indicate the extent and general arrangement of the systems. If any departure from the Contract Drawings is deemed necessary by the Contractor, details of such departures and the reasons therefore, shall be submitted to the Architect/Engineer for review as soon as practicable. No such departures shall be made without the prior written approval of the Architect/Engineer.

C. Notwithstanding any reference in the Specifications to any article, device, product, material, fixture, form or type of construction by name, make or catalog number, such reference shall not be construed as limiting competition; and the Contractor, in such cases, may at his option use any article, device, product, material, fixture, form or type of construction which in the judgment of the Architect/Engineer, expressed in writing, is the equivalent of that specified.

1.02 SCOPE OF WORK

A. The Work included under this Contract consists of the furnishing and installation of all equipment and material necessary and required to form complete and functioning systems in all of their various phases, all as shown on the accompanying Drawings and/or described in these Specifications. The Contractor shall review all pertinent drawings, including those of other contracts, prior to commencement of Work.

B. This Division requires the furnishing and installing of all items as specified herein, indicated on the Drawings or reasonably inferred as necessary for safe and proper operation; including every article, device or accessory (whether or not specifically called for by item) reasonably necessary to facilitate each system's functioning as indicated by the design and the equipment specified. Elements of the work include, but are not limited to, materials, labor, supervision, transportation, storage, equipment, utilities, all required permits, licenses and inspections. All work performed under this Section shall be in accordance with the Project Manual, Drawings and Specifications and is subject to the terms and conditions of the Contract.

C. The approximate locations of Mechanical (HVAC) items are indicated on the Drawings. These Drawings are not intended to give complete and accurate details in regard to location of outlets, apparatus, etc. Exact locations are to be determined by actual measurements at the building, and will in all cases be subject to the review of the Owner or Engineer, who reserves the right to make any reasonable changes in the locations indicated without additional cost to the Owner.

D. Items specifically mentioned in the Specifications but not shown on the Drawings and/or items shown on Drawings but not specifically mentioned in the Specifications shall be installed by the Contractor under the appropriate section of work as if they were both specified and shown.

E. All discrepancies between the Contract Documents and actual job-site conditions shall be reported to the Owner or Engineer so that they will be resolved prior to bidding. Where this cannot be done at least 7 working days prior to bid; the greater or more costly of the discrepancy shall be bid. All labor and materials required to perform the work described shall be included as part of this Contract.

F. It is the intention of this Section of the Specifications to outline minimum requirements to furnish the Owner with a turn-key and fully operating system in cooperation with other trades.

G. It is the intent of the above "Scope" to give the Contractor a general outline of the extent of the Work involved; however, it is not intended to include each and every item required for the Work. Anything omitted from the "Scope" but shown on the Drawings, or specified later, or necessary for a complete and functioning heating, ventilating and air conditioning system shall be considered a part of the overall "Scope".

H. The Contractor shall rough-in fixtures and equipment furnished by others from rough-in and placement drawings furnished by others. The Contractor shall make final connection to fixtures and equipment furnished by others.

I. The Contractor shall participate in the commissioning process as required; including, but not limited to, meeting attendance, completion of checklists, and participation in functional testing.

1.03 SCHEMATIC NATURE OF CONTRACT DOCUMENTS

A. The Contract Documents are schematic in nature in that they are only to establish scope and a minimum level of quality. They are not to be used as actual working construction drawings. The actual working construction drawings shall be the reviewed shop drawings.

B. All duct or pipe or equipment locations as indicated on the documents do not indicate every transition, offset, or exact location. All transitions, offsets, clearances and exact locations shall be established by actual field measurements, coordination with the structural, architectural and reflected ceiling plans, and other trades. Submit shop drawings for review.

C. All transitions, offsets and relocations as required by actual field conditions shall be performed by the Contractor at no additional cost to the Owner.

D. Additional coordination with electrical contractor may be required to allow adequate clearances of electrical equipment, fixtures and associated appurtenances. Contractor to notify Architect and Engineer of unresolved clearances, conflicts or equipment locations.

1.04 SITE VISIT AND FAMILIARIZATION

A. Before submitting a bid, it will be necessary for each Contractor whose work is involved to visit the site and ascertain for himself the conditions to be met therein in installing his work and make due provision for same in his bid. It will be assumed that this Contractor in submitting his bid has visited the premises and that his bid covers all work necessary to properly install the equipment shown. Failure on the part of the Contractor to comply with this requirement shall not be considered justification for the omission or faulty installation of any work covered by these Specifications and Drawings.

B. Understand the existing utilities from which services will be supplied; verify locations of utility services, and determine requirements for connections.

C. Determine in advance that equipment and materials proposed for installation fit into the confines indicated.

1.05 WORK SPECIFIED IN OTHER SECTIONS

A. Finish painting is specified. Prime and protective painting are included in the work of this Division.

B. Owner and General Contractor furnished equipment shall be properly connected to Mechanical (HVAC) systems.

C. Furnishing and installing all required Mechanical (HVAC) equipment control relays and electrical interlock devices, conduit, wire and J-boxes are included in the Work of this Division.

1.06 PERMITS, TESTS, INSPECTIONS

A. Arrange and pay for all permits, fees, tests, and all inspections as required by governmental authorities.

1.07 DATE OF FINAL ACCEPTANCE

A. The date of final acceptance shall be the date of Owner occupancy, or the date all punch list items have been completed, or the date final payment has been received. Refer to Division One for additional requirements.

B. The date of final acceptance shall be documented in writing and signed by the Architect, Owner and Contractor.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to the project properly identified with names, model numbers, types, grades, compliance labels, and other information needed for identification.

B. Deliver products to the project at such time as the project is ready to receive the equipment, pipe or duct - properly protected from incidental damage and weather damage.

C. Damaged equipment, duct or pipe shall be promptly removed from the site and new, undamaged equipment, pipe or duct shall be installed in its place

promptly with no additional charge to the Owner.

1.09 NOISE AND VIBRATION

A. The heating, ventilating and air conditioning systems, and the component parts thereof, shall be guaranteed to operate without objectionable noise and vibration.

B. Provide foundations, supports and isolators as specified or indicated, properly adjusted to prevent transmission of vibration to the building structure, piping and other items.

C. Carefully fabricate ductwork and fittings with smooth interior finish to prevent turbulence and generation or regeneration of noise.

D. All equipment shall be selected to operate with minimum of noise and vibration. If, in the opinion of the Architect, objectionable noise or vibration is produced or transmitted to or through the building structure by equipment, piping, ducts or other parts of the Work, the Contractor shall rectify such conditions without extra cost to the Owner.

1.10 APPLICABLE CODES

A. Obtain all required permits and inspections for all work required by the Contract Documents and pay all required fees in connection thereof.

B. Arrange with the serving utility companies for the connection of all required utilities and pay all charges, meter charges, connection fees and inspection fees, if required.

C. Comply with all applicable codes, specifications, local ordinances, industry standards, utility company regulations and the applicable requirements which includes and is not limited to the following nationally accepted codes and standards:

1. Air Moving & Conditioning Association, AMCA.
2. American Standards Association, ASA.
3. American Society of Heating, Refrigerating, and Air-Conditioning Engineers, Inc., ASHRAE.
4. American Society of Mechanical Engineers, ASME.
5. American Society of Plumbing Engineers, ASPE.
6. American Society of Testing Materials, ASTM.
7. American Water Works Association, AWWA.
8. National Bureau of Standards, NBS.
9. National Fire Protection Association, NFPA.
10. Sheet Metal & Air Conditioning Contractors' National Association, SMACNA.
11. Underwriters' Laboratories, Inc., UL.
12. International Energy Conservation Code, IECC.
13. International Fire Code.
14. International Gas Code.

D. Where differences existing between the Contract Documents and applicable

state or city building codes, state and local ordinances, industry standards, utility company regulations and the applicable requirements of the nationally accepted codes and standards, the more stringent or costly application shall govern. Promptly notify the Engineer in writing of all differences.

E. When directed in writing by the Engineer, remove all work installed that does not comply with the Contract Documents and applicable state or city building codes, state and local ordinances, industry standards, utility company regulations and the applicable requirements of the above listed nationally accepted codes and standards, correct the deficiencies, and complete the work at no additional cost to the Owner.

1.11 DEFINITIONS AND SYMBOLS

A. General Explanation: A substantial amount of construction and Specification language constitutes definitions for terms found in other Contract Documents, including Drawings which must be recognized as diagrammatic and schematic in nature and not completely descriptive of requirements indicated thereon. Certain terms used in Contract Documents are defined generally in this article, unless defined otherwise in Division 01.

B. Definitions and explanations of this Section are not necessarily either complete or exclusive, but are general for work to the extent not stated more explicitly in another provision of the Contract Documents.

C. Indicated: The term "Indicated" is a cross-reference to details, notes or schedules on the Drawings, to other paragraphs or schedules in the Specifications and to similar means of recording requirements in Contract Documents. Where such terms as "Shown", "Noted", "Scheduled", "Specified" and "Detailed" are used in lieu of "Indicated", it is for the purpose of helping the reader locate cross-reference material, and no limitation of location is intended except as specifically shown.

D. Directed: Where not otherwise explained, terms such as "Directed", "Requested", "Accepted", and "Permitted" mean by the Architect or Engineer. However, no such implied meaning will be interpreted to extend the Architect's or Engineer's responsibility into the Contractor's area of construction supervision.

E. Reviewed: Where used in conjunction with the Engineer's response to submittals, requests for information, applications, inquiries, reports and claims by the Contractor the meaning of the term "Reviewed" will be held to limitations of Architect's and Engineer's responsibilities and duties as specified in the General and Supplemental Conditions. In no case will "Reviewed" by Engineer be interpreted as a release of the Contractor from responsibility to fulfill the terms and requirements of the Contract Documents.

F. Furnish: Except as otherwise defined in greater detail, the term "Furnish" is used to mean supply and deliver to the project site, ready for unloading, unpacking, assembly, installation, etc., as applicable in each instance.

G. Install: Except as otherwise defined in greater detail, the term "Install" is used to describe operations at the project site including unloading, unpacking,

assembly, erection, placing, anchoring, applying, working to dimension, finishing, curing, protection, cleaning and similar operations, as applicable in each instance.

H. Provide: Except as otherwise defined in greater detail, the term "Provide" is used to mean "Furnish and Install", complete and ready for intended use, as applicable in each instance.

I. Installer: Entity (person or firm) engaged by the Contractor, or its Subcontractor or Sub-subcontractor for performance of a particular unit of work at the project site, including unloading, unpacking, assembly, erection, placing, anchoring, applying, working to dimension, finishing, curing, protection, cleaning and similar operations, as applicable in each instance. It is a general requirement that such entities (Installers) be expert in the operations they are engaged to perform.

J. Imperative Language: Used generally in Specifications. Except as otherwise indicated, requirements expressed imperatively are to be performed by the Contractor. For clarity of reading at certain locations, contrasting subjective language is used to describe responsibilities that must be fulfilled indirectly by the Contractor or, when so noted, by other identified installers or entities.

K. Minimum Quality/Quantity: In every instance, the quality level or quantity shown or specified is intended as minimum quality level or quantity of work to be performed or provided. Except as otherwise specifically indicated, the actual work may either comply exactly with that minimum (within specified tolerances), or may exceed that minimum within reasonable tolerance limits. In complying with requirements, indicated or scheduled numeric values are either minimums or maximums as noted or as appropriate for the context of the requirements. Refer instances of uncertainty to Owner or Engineer via a request for information (RFI) for decision before proceeding.

L. Abbreviations and Symbols: The language of Specifications and other Contract Documents including Drawings is of an abbreviated type in certain instances, and implies words and meanings which will be appropriately interpreted. Actual word abbreviations of a self-explanatory nature have been included in text of Specifications and Drawings. Specific abbreviations and symbols have been established, principally for lengthy technical terminology and primarily in conjunction with coordination of Specification requirements with notations on Drawings and in Schedules. These are frequently defined in Section at first instance of use or on a Legend and Symbol Drawing. Trade and industry association names and titles of generally recognized industry standards are frequently abbreviated. Singular words will be interpreted as plural and plural words will be interpreted as singular where applicable and where full context of Contract Documents so indicate. Except as otherwise indicated, graphic symbols and abbreviations used on Drawings and in Specifications are those recognized in construction industry for indicated purposes. Where not otherwise noted symbols and abbreviations are defined by the latest ASHRAE Fundamentals Handbook, chapter 34 "Abbreviations and Symbols", ASME and ASPE published standards.

1.12 DRAWINGS AND SPECIFICATIONS

A. These Specifications are intended to supplement the Drawings and it will not be the province of the Specifications to mention any part of the Work which the Drawings are competent to fully explain in every particular and such omission is not to relieve the Contractor from carrying out portions indicated on the Drawings only.

B. Should items be required by these Specifications and not indicated on the Drawings, they are to be supplied even if of such nature that they could have been indicated thereon. In case of disagreement between Drawings and Specifications, or within either Drawings or Specifications, the better quality or greater quantity of work shall be estimated and the matter referred to the Architect or Engineer for review with a request for information and clarification at least 7 working days prior to bid opening date for issuance of an addendum.

C. The listing of product manufacturers, materials and methods in the various sections of the Specifications, and indicated on the Drawings, is intended to establish a standard of quality only. It is not the intention of the Owner or Engineer to discriminate against any product, material or method that is the equivalent of the standards as indicated and/or specified, nor is it intended to preclude open, competitive bidding. The fact that a specific manufacturer is listed as an acceptable manufacturer should not be interpreted to mean that the manufacturer's standard product will meet the requirements of the project design, Drawings, Specifications and space constraints.

D. The Architect or Engineer and Owner shall be the sole judge of quality and equivalence of equipment, materials and methods.

E. Products by other reliable manufacturers, other materials, and other methods, will be accepted as outlined, provided they have equivalent capacity, construction, and performance. However, under no circumstances shall any substitution be made without the written permission of the Architect or Engineer and Owner. Request for prior approval must be made in writing 10 days prior to the bid date without fail.

F. Wherever a definite product, material or method is specified and there is not a statement that another product, material or method will be acceptable, it is the intention of the Owner or Engineer that the specified product, material or method is the only one that shall be used without prior approval.

G. Wherever a definite material or manufacturer's product is specified and the Specification states that products of similar design and equivalent construction from the specified list of manufacturers may be substituted, it is the intention of the Owner or Engineer that products of manufacturers that are specified are the only products that will be acceptable and that products of other manufacturers will not be considered for substitution without approval.

H. Wherever a definite product, material or method is specified and there is a statement that "OR EQUIVALENT" product, material or method will be acceptable, it is the intention of the Owner or Engineer that the specified product, material or method or an "OR EQUIVALENT" product, material or method may be used if it complies with the Specifications and is submitted for

review to the Engineer as outline herein.

I. Where permission to use substituted or alternative equipment on the project is granted by the Owner or Engineer in writing, it shall be the responsibility of the Contractor or Subcontractor involved to verify that the equipment will fit in the space available which includes allowances for all required Code and maintenance clearances, and to coordinate all equipment structural support, plumbing and electrical requirements and provisions with the Mechanical (HVAC) Design Documents and all other trades, including Division 26.

J. Changes in architectural, structural, electrical, mechanical, and plumbing requirements for the substitution shall be the responsibility of the bidder wishing to make the substitution. This shall include the cost of redesign by the affected designer(s). Any additional cost incurred by affected Subcontractors shall be the responsibility of this bidder and not the Owner.

K. If any request for a substitution of product, material or method is rejected, the Contractor will automatically be required to furnish the product, material or method named in the Specifications. Repetitive requests for substitutions will not be considered.

L. The Owner or Engineer will investigate all requests for substitutions when submitted in accordance with the requirements listed above; and if accepted, will issue a letter allowing the substitutions.

M. Where equipment other than that used in the design as specified or shown on the Drawings is substituted (either from an approved manufacturers list or by submittal review), it shall be the responsibility of the substituting Contractor to coordinate space requirements, building provisions and connection requirements with his trades and all other trades; and to pay all additional costs to other trades, the Owner, the Architect or Engineer, if any, due to the substitutions.

1.13 SUBMITTALS

A. Coordinate with Division 01 for submittal timetable requirements, unless noted otherwise within thirty (30) days after the Contract is awarded. The Contractor shall submit an electronic copy of a complete set of shop drawings and complete data covering each item of equipment or material. The submittal of each item requiring a submittal must be received by the Architect or Engineer within the above thirty day period. The Architect or Engineer shall not be responsible for any delays or costs incurred due to excessive shop drawing review time for submittals received after the thirty (30) day time limit. The Architect and Engineer will retain a copy of all shop drawings for their files. All literature pertaining to items subject to Shop Drawing submittal shall be submitted at one time. Submittals shall be placed in one electronic file in PDF 8.0 format and bookmarked for individual specification sections. Individual electronic files of submittals for individual specifications shall not be permitted. Each submittal shall include the following items:

1. A cover sheet with the names and addresses of the Project, Architect, MEP Engineer, General Contractor and the Subcontractor making the submittal. The cover sheet shall also contain the section number

covering the item or items submitted and the item nomenclature or description.

2. An index page with a listing of all data included in the Submittal.
3. A list of variations page with a listing of all variations, including unfurnished or additional required accessories, items or other features, between the submitted equipment and the specified equipment. If there are no variations, then this page shall state "NO VARIATIONS". Where variations affect the work of other Contractors, then the Contractor shall certify on this page that these variations have been fully coordinated with the affected Contractors and that all expenses associated with the variations will be paid by the submitting Contractor. This page will be signed by the submitting Contractor.
4. Equipment information including manufacturer's name and designation, size, performance and capacity data as applicable. All applicable Listings, Labels, Approvals and Standards shall be clearly indicated.
5. Dimensional data and scaled drawings as applicable to show that the submitted equipment will fit the space available with all required Code and maintenance clearances clearly indicated and labeled at a minimum scale of 1/4" = 1'-0", as required to demonstrate that the alternate or substituted product will fit in the space available.
6. Identification of each item of material or equipment matching that indicated on the Drawings.
7. Sufficient pictorial, descriptive and diagrammatic data on each item to show its conformance with the Drawings and Specifications. Any options or special requirements or accessories shall be so indicated. All applicable information shall be clearly indicated with arrows or another approved method.
8. Additional information as required in other Sections of this Division.
9. Certification by the General Contractor and Subcontractor that the material submitted is in accordance with the Drawings and Specifications, signed and dated in long hand. Submittals that do not comply with the above requirements shall be returned to the Contractor and shall be marked "REVISE AND RESUBMIT".

B. Refer to Division 00 and Division 01 for additional information on shop drawings and submittals.

C. Equipment and materials submittals and shop drawings will be reviewed for compliance with design concept only. It will be assumed that the submitting Contractor has verified that all items submitted can be installed in the space allotted. Review of shop drawings and submittals shall not be considered as a verification or guarantee of measurements or building conditions.

D. Where shop drawings and submittals are marked "REVIEWED", the review of the submittal does not indicate that submittals have been checked in detail nor does it in any way relieve the Contractor from his responsibility to furnish material and perform work as required by the Contract Documents.

E. Shop drawings shall be reviewed and returned to the Contractor with one of the following categories indicated:

1. REVIEWED: Contractor need take no further submittal action, shall

include this submittal in the O&M manual and may order the equipment submitted on.

2. REVIEWED AS NOTED: Contractor shall submit a letter verifying that required exceptions to the submittal have been received and complied with including additional accessories or coordination action as noted, and shall include this submittal and compliance letter in the O&M manual. The contractor may order the equipment submitted on at the time of the returned submittal providing the Contractor complies with the exceptions noted.
3. NOT APPROVED: Contractor shall resubmit new submittal on material, equipment or method of installation when the alternate or substitute is not approved. The Contractor will automatically be required to furnish the product, material or method named in the Specifications and/or Drawings. Contractor shall not order equipment that is not approved. Repetitive requests for substitutions will not be considered.
4. REVISE AND RESUBMIT: Contractor shall resubmit new submittal on material, equipment or method of installation when the alternate or substitute is marked revise and resubmit. The Contractor will automatically be required to furnish the product, material or method named in the Specifications and/or provide as noted on previous shop drawings. Contractor shall not order equipment marked revise and resubmit. Repetitive requests for substitutions will not be considered.
5. CONTRACTOR'S CERTIFICATION REQUIRED: Contractor shall resubmit submittal on material, equipment or method of installation. The Contractor's stamp is required stating that the submittal meets all conditions of the Contract Documents. The stamp shall be signed by the General Contractor. The submittal will not be reviewed if the stamp is not placed and signed on all shop drawings.
6. MANUFACTURER NOT AS SPECIFIED: Contractor shall resubmit new submittal on material, equipment or method of installation when the alternate or substitute is marked manufacturer not as specified. The Contractor will automatically be required to furnish the product, material or method named in the Specifications. Contractor shall not order equipment when submittal is marked manufacturer not as specified. Repetitive requests for substitutions will not be considered.

F. Materials and equipment which are purchased or installed without submittal review shall be at the risk of the Contractor and the cost for removal and replacement of such materials and equipment and related work which is judged unsatisfactory by the Owner or Engineer for any reason shall be at the expense of the Contractor. The responsible Contractor shall remove the material and equipment noted above and replace with specified equipment or material at his own expense when directed in writing by the Architect or Engineer.

G. Shop Drawing Submittals shall be complete and checked prior to submission to the Engineer for review.

H. Submittals are required for, but not limited to, the following items subject to project requirements:

1. Coordination Drawings
2. Common Motor Requirements for HVAC Equipment

3. Testing, Adjusting, and Balancing – For Public Projects
4. Duct Insulation
5. HVAC Piping Insulation
6. Metal Ductwork
7. Ductwork Accessories
8. Air Distribution Devices
9. Air Filters
10. Rooftop Heating and Cooling Units Electric Cooling-Electric Heat

I. Refer to other Division 23 sections for additional submittal requirements. Provide samples of actual materials and/or equipment to be used on the Project upon request of the Owner or Engineer.

1.14 COORDINATION DRAWINGS

A. Prepare coordination drawings to a scale of 1/4"=1'-0" or larger; detailing major elements, components, and systems of mechanical equipment and materials in relationship with other systems, installations, and building components. Indicate locations where space is limited for installation and access, and where sequencing and coordination of installations are of importance to the efficient flow of the Work, including (but not necessarily limited to) the following:

1. Indicate the proposed locations of pipe, duct, equipment, and other materials. Include the following:

    a. Wall and type locations.
    b. Clearances for installing and maintaining insulation.
    c. Locations of light fixtures and sprinkler heads.
    d. Clearances for servicing and maintaining equipment, including tube removal, filter removal, and space for equipment disassembly required for periodic maintenance.
    e. Equipment connections and support details.
    f. Exterior wall and foundation penetrations.
    g. Routing of storm and sanitary sewer piping.
    h. Fire-rated wall and floor penetrations.
    i. Sizes and location of required concrete pads and bases.
    j. Valve stem movement.
    k. Structural floor, wall and roof opening sizes and details.

2. Indicate scheduling, sequencing, movement, and positioning of large equipment into the building during construction.
3. Prepare floor plans, elevations, and details to indicate penetrations in floors, walls, and ceilings and their relationship to other penetrations and installations.
4. Prepare reflected ceiling plans to coordinate and integrate installations, air distribution devices, light fixtures, communication systems components, and other ceiling-mounted items.

B. This Contractor shall be responsible for coordination of all items that will affect the installation of the work of this Division. This coordination shall include, but not be limited to: voltage, ampacity, capacity, electrical and piping connections, space requirements, sequence of construction, building

requirements and special conditions.

C. By submitting coordination drawings on the project, this Contractor is indicating that all necessary coordination has been completed and that the systems, products and equipment submitted can be installed in the building and will operate as specified and intended, in full coordination with all other Contractors and Subcontractors.

1.15 RECORD DOCUMENTS

A. Prepare Record Documents in accordance with the requirements in Special Project Requirements, in addition to the requirements specified in Division 23, indicate the following installed conditions:

1. Duct mains and branches, size and location, for both exterior and interior; locations of dampers, fire dampers, duct access panels, and other control devices; filters, fuel fired heaters, fan coils, condensing units, and roof-top A/C units requiring periodic maintenance or repair.
2. Mains and branches of piping systems, with valves and control devices located and numbered, concealed unions located, and with items requiring maintenance located (i.e., traps, strainers, expansion compensators, tanks, etc.). Valve location diagrams, complete with valve tag chart. Indicate actual inverts and horizontal locations of underground piping.
3. Equipment locations (exposed and concealed), dimensioned from prominent building lines.
4. Approved substitutions, Contract Modifications, and actual equipment and materials installed.
5. Contract Modifications, actual equipment and materials installed.

B. Engage the services of a Land Surveyor or Professional Engineer registered in the state in which the project is located as specified herein to record the locations and invert elevations of underground installations.

C. The Contractor shall maintain a set of clearly marked black line record "AS-BUILT" prints on the job site on which he shall mark all work details, alterations to meet site conditions and changes made by "Change Order" notices. These shall be kept available for inspection by the Owner, Architect or Engineer at all times.

D. Refer to Division 00 and Division 01 for additional requirements concerning Record Drawings. If the Contractor does not keep an accurate set of as-built drawings, the pay request may be altered or delayed at the request of the Architect. Mark the drawings with a colored pencil. Delivery of as-built prints and re-producibles is a condition of substantial completion.

E. The record prints shall be updated on a daily basis and shall indicate accurate dimensions for all buried or concealed work, precise locations of all concealed pipe or duct, locations of all concealed valves, controls and devices and any deviations from the work shown on the Construction Documents which are required for coordination. All dimensions shall include at least two dimensions to permanent structure points.

F. Submit three prints of the tracings for review. Make corrections to tracings as directed and deliver "Auto Positive Tracings" to the Architect. "As-Built" drawings shall be furnished in addition to submittals.

G. When the option described in paragraph F above is not exercised, then upon completion of the Work, the Contractor shall transfer all marks from the tracings and submit a set of clear concise reproducible record "AS-BUILT" drawings and shall submit the reproducible drawings with corrections made by a competent draftsman and three (3) sets of black line prints to the Architect or Engineer for review prior to scheduling the final inspection at the completion of the Work. The reproducible record "AS-BUILT" drawings shall have the Engineer's Name and Seal removed or blanked out and shall be clearly marked and signed on each sheet as follows:

CERTIFIED RECORD DRAWINGS
DATE:
(NAME OF GENERAL CONTRACTOR)

BY:_____
(SIGNATURE)

(NAME OF SUBCONTRACTOR)

BY:_____
(SIGNATURE)

1.16 OPERATING AND MAINTENANCE MANUALS

A. Prepare operating and maintenance manuals in accordance with Division 00 and Division 01 and, in addition to the requirements specified in those Divisions, include the following information for equipment items:

1. Description of function, normal operating characteristics and limitations, performance curves, engineering data and tests, and complete nomenclature and commercial numbers of replacement parts.
2. Manufacturer's printed operating procedures to include start-up, break-in, and routine and normal operating instructions; regulation, control, stopping, shutdown, and emergency instructions; and summer and winter operating instructions.
3. Maintenance procedures for routine preventative maintenance and troubleshooting; disassembly, repair, and reassembly; aligning and adjusting instructions.
4. Servicing instructions and lubrication charts and schedules.

1.17 CERTIFICATIONS AND TEST REPORTS

A. Submit a detailed schedule for completion and testing of each system indicating scheduled dates for completion of system installation and outlining tests to be performed and scheduled date for each test. This detailed completion and test schedule shall be submitted at least 90 days before the projected substantial completion date.

B. Test result reporting forms shall be submitted for review no later than the date of the detailed schedule.

C. Submit 4 copies of all certifications and test reports to the Architect or Engineer for review adequately in advance of substantial completion of the Work to allow for remedial action as required to correct deficiencies discovered in equipment and systems.

D. Certifications and test reports to be submitted shall include, but not be limited to, those items outlined in Section 23 02 00.

1.18 OPERATING AND MAINTENANCE MANUALS

A. Coordinate with Division 00 and Division 01 for operating and maintenance manual requirements. Unless noted otherwise, bind together in "D ring type" binders (National model no. 79-883 or equal). Binders shall be large enough to allow ¼" of spare capacity. Three (3) sets of all reviewed submittals, fabrication drawings, bulletins, maintenance instructions, operating instructions and parts exploded views and lists for each and every piece of equipment furnished under these Specifications. All sections shall be typed and indexed into sections and labeled for easy reference and shall utilize the individual specification section numbers shown in the Mechanical Specifications as an organization guideline. Bulletins containing information about equipment that is not installed on the project shall be properly marked up or stripped and reassembled. All pertinent information required by the Owner for proper operation and maintenance of equipment supplied by Division 23 shall be clearly and legibly set forth in memoranda that shall, likewise, be bound with bulletins.

B. Prepare maintenance manuals in accordance with Special Project Conditions. In addition to the requirements specified in Division 23, include the following information for equipment items:

1. Identifying names, name tag designations and locations for all equipment.
2. Valve tag lists with valve number, type, color coding, location and function.
3. Reviewed submittals with exceptions noted compliance letter.
4. Fabrication drawings.
5. Equipment and device bulletins and data sheets clearly highlighted to show equipment installed on the project and including performance curves and data as applicable (i.e., description of function, normal operating characteristics and limitations, performance curves, engineering data and tests, and complete nomenclature and model numbers of replacement parts).
6. Manufacturer's printed operating procedures to include start-up, break-in, and routine and normal operating instructions; regulation, control, stopping, shutdown, and emergency instructions; and summer and winter operating instructions.
7. Maintenance procedures for routine preventative maintenance and troubleshooting; disassembly, repair, and reassembly; aligning and adjusting instructions, servicing instructions and lubrication charts and schedules.

8. Equipment and motor name plate data.
9. Wiring diagrams.
10. Exploded parts views and parts lists for all equipment and devices.
11. Color coding charts for all painted equipment and piping.
12. Location and listing of all spare parts and special keys and tools furnished to the Owner.
13. Furnish recommended lubrication schedule for all required lubrication points with listing of type and approximate amount of lubricant required.

C. Refer to Division 00 and Division 01 for additional information on Operating and Maintenance Manuals.

D. Operating and Maintenance Manuals shall be turned over to the Owner or Engineer for review a minimum of 14 working days prior to the beginning of the operator training period.

1.19 OPERATOR TRAINING

A. The Contractor shall furnish the services of factory trained specialists to instruct the Owner's operating personnel. The Owner's operator training shall include a minimum of 12 hours of onsite training in three 4 hour shifts.

B. Before proceeding with the instruction of Owner Personnel, prepare a typed outline in triplicate, listing the subjects that will be covered in this instruction, and submit the outline for review by the Owner. At the conclusion of the instruction period, obtain the signature of each person being instructed on each copy of the reviewed outline to signify that he has a proper understanding of the operation and maintenance of the systems and resubmit the signed outlines.

C. Refer to other Division 23 Sections for additional Operator Training requirements.

1.20 FINAL COMPLETION

A. At the completion of the Work, all equipment and systems shall be tested and faulty equipment and material shall be repaired or replaced. Refer to Sections of Division 23 for additional requirements.

B. Clean and adjust all air distribution devices and replace all air filters immediately prior to Substantial Completion.

C. Touch up and/or refinish all scratched equipment and devices immediately prior to Substantial Completion.

1.21 CONTRACTOR'S GUARANTEE

A. Use of the HVAC systems to provide temporary service during construction period will not be allowed without permission from the Owner in writing; and, if granted, shall not cause the warranty period to start, except as defined below.

B. Contractor shall guarantee to keep the entire installation in repair and perfect working order for a period of one year after the date of the Substantial Completion, and shall furnish (free of additional cost to the Owner) all materials and labor necessary to comply with the above guarantee throughout the year beginning from the date of Substantial Completion, Beneficial Occupancy by the Owner, or the Certificate of Final Payment as agreed upon by all parties.

C. This guarantee shall not include cleaning or changing filters except as required by testing, adjusting and balancing.

D. All air conditioning compressors shall have parts and labor guarantees for a period of not less than 5 years beyond the date of Substantial Completion.

E. Refer to Sections in Division 23 for additional guarantee or warranty requirements.

1.22 TRANSFER OF ELECTRONIC FILES

A. Project documents are not intended or represented to be suitable for reuse by Architect/Owner or others on extensions of this project or on any other project. Any such reuse or modification without written verification or adaptation by Engineer, as appropriate for the specific purpose intended, will be at Architect/Owner's risk and without liability or legal exposure to Engineer or its consultants from all claims, damages, losses and expense, including attorney's fees arising out of or resulting thereof.

B. Because data stored in electronic media format can deteriorate or be modified inadvertently, or otherwise, without authorization of the data's creator, the party receiving the electronic files agrees that it will perform acceptance tests or procedures within sixty (60) days of receipt, after which time the receiving party shall be deemed to have accepted the data thus transferred to be acceptable. Any errors detected within the sixty (60) day acceptance period will be corrected by the party delivering the electronic files. Engineer is not responsible for maintaining documents stored in electronic media format after acceptance by the Architect/Owner.

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

D. Any reuse or modifications will be at the Contractor's sole risk and without liability or legal exposure to Architect, Engineer or any consultant.

E. The Texas Board of Architectural Examiners (TBAE) has stated that it is in violation of Texas law for persons other than the Architect of record to revise the Architectural drawings without the Architect's written consent.

1. It is agreed that "MEP" hard copy or computer-generated documents will not be issued to any other party except directly to the Architect/Owner. The Contract Documents are contractually

copyrighted and cannot be used for any other project or purpose except as specifically indicated in AIA B-141 Standard Form of Agreement Between Architect and Owner.

2. If the client, Architect/Owner, or developer of the project requires electronic media for "record purposes", then an AutoCAD based compact disc ("CD") will be prepared. The "CD" will be submitted with all title block references intact and will be formatted in a "plot" format to permit the end user to only view and plot the drawings. Revisions will not be permitted in this configuration.

F. At the Architect/Owner's request, Engineer will prepare one "CD" of electronic media to assist the Contractor in the preparation of submittals. The Engineer will prepare and submit the "CD" to the Architect/Owner for distribution to the Contractor.

1. The "CD" will be prepared and all title blocks, names and dates will be removed. The "CD" will be prepared in a ".dwg" format to permit the end user to revise the drawings.

PRODUCTS

1.23 MATERIALS

A. Provide materials and equipment manufactured by a domestic United States manufacturer and assembled in the United States for all local and Federal Government projects. These materials and equipment shall comply with "Buy American Act."

B. Access Doors: Provide access doors as required for access to equipment, valves, controls, cleanouts and other apparatus where concealed. Access doors shall have concealed hinges and screw driver cam locks.

C. All access doors located in wet areas such as restrooms, locker rooms, shower rooms, kitchen and any other wet areas shall be constructed of stainless steel.

D. Access Doors: shall be as follows:

1. Plaster Surfaces: Milcor Style K.
2. Ceramic Tile Surface: Milcor Style M.
3. Drywall Surfaces: Milcor Style DW.
4. Install doors only in locations approved by the Architect.

1.24 EQUIPMENT PADS (See 2.04 in Section 26 02 00)

EXECUTION

1.25 ROUGH-IN

A. Verify final locations for rough-ins with field measurements and with the requirements of the actual equipment to be connected via reviewed submittals.

B. Refer to equipment specifications in Divisions 2 through 48 for additional rough-in requirements.

1.26 MECHANICAL INSTALLATIONS

A. General: Sequence, coordinate, and integrate the various elements of mechanical systems, materials, and equipment. Comply with the following requirements:

1. Coordinate mechanical systems, equipment, and materials installation with other building components.
2. Verify all dimensions by field measurements.
3. Arrange for chases, slots, and openings in other building components during progress of construction, to allow for mechanical installations.
4. Coordinate the installation of required supporting devices and sleeves to be set in poured-in-place concrete and other structural components, as they are constructed.
5. Sequence, coordinate, and integrate installations of mechanical materials and equipment for efficient flow of the Work. Give particular attention to large equipment requiring positioning prior to closing in the building.
6. Where mounting heights are not detailed or dimensioned, install systems, materials, and equipment to provide the maximum headroom possible.
7. Coordinate connection of mechanical systems with exterior underground and overhead utilities and services. Comply with requirements of governing regulations, franchised service companies, and controlling agencies. Provide required connection for each service.
8. Install systems, materials, and equipment to conform with architectural action markings on submittal, including coordination drawings, to greatest extent possible. Conform to arrangements indicated by the Contract Documents, recognizing that portions of the Work are shown only in diagrammatic form. Where coordination requirements conflict with individual system requirements, resolve conflicts and submit proposed solution to the Architect for review.
9. Install systems, materials, and equipment level and plumb, parallel and perpendicular to other building systems and components, where installed exposed in finished spaces.
10. Install mechanical equipment to facilitate servicing, maintenance, and repair or replacement of equipment components. As much as possible, connect equipment for ease of disconnecting, with minimum of interference with other installations. Extend grease fittings to an accessible location and label.
11. Install access doors where units are concealed behind finished surfaces. Refer to paragraph 2.01 in this section and architect for access doors specifications and location.
12. Install systems, materials, and equipment giving right-of-way priority to systems required to be installed at a specified slope.
13. Provide roof curbs for all roof mounted equipment. Coordinate with roof construction for pitched roof. Provide roof curbs which match the roof slope and provides a level top for equipment installation. Refer to Architectural drawings and details.
14. The equipment to be furnished under these Specifications shall be

essentially the standard product of the manufacturer. Where two or more units of the same class of equipment are required, these units shall be products of a single manufacturer; however, the component parts of the system need not be the product of the same manufacturer.

15. The Architectural and Structural features of the building and the space limitations shall be considered in selection of all equipment. No equipment shall be furnished which will not suit the arrangement and space limitations indicated.
16. Lubrication: Prior to start-up, check and properly lubricate all bearings as recommended by the manufacturer.
17. Where the word "Concealed" is used in these Specifications in connection with insulating, painting, piping, ducts, etc., it shall be understood to mean hidden from sight as in chases, furred spaces or suspended ceilings. "Exposed" shall be understood to mean the opposite of concealed.
18. Identification of Mechanical Equipment:

    a. Mechanical equipment shall be identified by means of nameplates permanently attached to the equipment. Nameplates shall be engraved laminated plastic or etched metal. Submittals shall include dimensions and lettering format for approval. Attachment shall be with escutcheon pins, self-tapping screws, or machine screws.
    b. Tags shall be attached to all valves, including control valves, with nonferrous chain. Tags shall be brass and at least 1-1/2 inches in diameter. Nameplate and tag symbols shall correspond to the identification symbols on the temperature control submittal and the "as-built" drawings.

19. Provide construction filters for all air handling units, fain coil unit, UAV boxes, and all other air handling equipment during the entire construction period.

1.27 CUTTING AND PATCHING

A. Protection of Installed Work: During cutting and patching operations, protect adjacent installations.

B. Perform cutting, fitting, and patching of mechanical equipment and materials required to:

1. Uncover Work to provide for installation of ill-timed Work.
2. Remove and replace defective Work.
3. Remove and replace Work not conforming to requirements of the Contract Documents.
4. Remove samples of installed Work as specified for testing.
5. Install equipment and materials in existing structures.
6. Upon written instructions from the Engineer, uncover and restore Work to provide for Engineer/Owner's observation of concealed Work, without additional cost to the Owner.
7. Patch existing finished surfaces and building components using new materials matching existing materials and experienced Installers.

Patch finished surfaces and building components using new materials specified for the original installation and experienced Installers; refer to the materials and methods required for the surface and building components being patched; Refer to Paragraph 1.11 I for definition of "Installer."

C. Cut, remove and legally dispose of selected mechanical equipment, components, and materials as indicated, including but not limited to removal of mechanical piping, mechanical ducts and HVAC units, and other mechanical items made obsolete by the new Work.

D. Protect the structure, furnishings, finishes, and adjacent materials not indicated or scheduled to be removed.

E. Provide and maintain temporary partitions or dust barriers adequate to prevent the spread of dust and dirt to adjacent areas.

1.28 WORK SEQUENCE, TIMING, COORDINATION WITH OWNER, ARCHITECT AND ENGINEER

A. The Owner will cooperate with the Contractor, however, the following provisions must be observed:

1. A meeting will be held at the project site, prior to any construction, between the Owner's Representative, the General Contractor, the Sub-Contractors and the Engineer to discuss Contractor's employee parking space, access, storage of equipment or materials, and use of the Owner's facilities or utilities. The Owner's decisions regarding such matters shall be final.
2. During the construction of this project, normal facility activities will continue in existing buildings until renovated areas are completed. Plumbing, fire protection, lighting, electrical, communications, heating, air conditioning, and ventilation systems shall be maintained in service within the occupied spaces of the existing building.
3. Contractor shall not start-up any of the HVAC equipment unless the Owner, Architect and Engineer are signed off.
4. Start-up for major HVAC equipment such as chillers, cooling towers, variable frequency drives and hot water boilers shall be performed by a factory technician. The start-up shall include a written report signed off by Contractor, Engineer and Owner.

1.29 DEMOLITION AND WORK WITHIN EXISTING BUILDINGS

A. In the preparation of these documents every effort has been made to show the approximate locations of, and connections to, the existing piping, duct, equipment and other apparatus related to this phase of the Work. However, this Contractor shall be responsible for verifying all of the above information. This Contractor shall visit the existing site to inspect the facilities and related areas. This Contractor shall inspect and verify all details and requirements of all the Contract Documents, prior to the submission of a proposal. All discrepancies between the Contract Documents and actual job-site conditions shall be resolved by the contractor, who shall produce drawings that shall be submitted to the Architect/Engineer for review. All labor and materials

required to perform the work described shall be a part of this Contract.

B. All equipment and/or systems noted on the Drawings "To Remain" shall be inspected and tested on site to certify its working condition. A written report on the condition of all equipment to remain, including a copy of the test results and recommended remedial actions and costs shall be made by this Contractor to the Architect/Engineer for review.

C. All equipment and/or systems noted on the Drawings "To Be Removed" shall be removed including, associated pipe and duct, pipe and duct hangers and/or line supports. Where duct or pipe is to be capped for future or end of line use, it shall be properly tagged with its function or service appropriately identified. Where existing equipment is to be removed or relocated and has an electric motor or connection, the Electrical Contractor shall disconnect motor or connection, remove wiring to a safe point and this Contractor shall remove or relocate motor or connection along with the equipment.

D. During construction and remodeling, portions of the Project shall remain in service. Construction equipment, material, tools, extension cords, etc., shall be arranged so as to present minimum hazard or interruption to the occupants of the building. None of the construction work shall interfere with the proper operation of the existing facility; or be so conducted as to cause harm or danger to persons on the premises. All fire exits, stairs or corridors required for proper access, circulation or exit shall remain clear of equipment, materials or debris. The General Contractor shall maintain barricades, other separations in corridors and other spaces where work is conducted.

E. Certain work during the demolition and construction phases may require overtime or night time shifts or temporary evacuation of the occupants. Coordinate and schedule all proposed down time with the Owner at least seventy-two (72) hours in advance in writing.

F. Any salvageable equipment as determined by the Owner, shall be delivered to the Owner, and placed in storage at the location of his choice. All other debris shall be removed from the site immediately.

G. Equipment, piping or other potential hazards to the occupants of the building shall not be left overnight outside of the designated working or construction area.

H. Make every effort to minimize damage to the existing building and the Owner's property. Repair, patch or replace as required any damage that occurs as a result of work at the site. Care shall be taken to minimize interference with the Owner's activities during construction and to keep construction disrupted areas to a minimum. Coordinate with the Owner and other trades in scheduling and performance of the work.

I. Include in the contract price all rerouting of existing pipe, duct, etc., and the reconnecting of the existing equipment as necessitated by field conditions to allow the installation of the new systems regardless of whether or not such rerouting, reconnecting or relocating is shown on the Drawings. Furnish all temporary pipe, duct, controls, etc., as required to maintain heating, cooling, and ventilation services for the existing areas with a minimum of interruption.

J. All existing pipe, duct, materials, equipment, controls and appurtenances not included in the remodel or alteration areas are to remain in place.

K. Pipe, duct, equipment and controls serving mechanical and other Owner's equipment, etc., which is to remain but is served by pipe, duct, equipment and controls that are disturbed by the remodeling work, shall be reconnected in such a manner as to leave this equipment in proper operating condition.

L. No portion of the fire protection systems shall be turned off, modified or changed in any way without the express knowledge and written permission of the Owner’s representative in order to protect systems that shall remain in service.

M. It is the intention of this Section of the Specifications to outline minimum requirements to furnish the Owner with a turn-key and operating system in cooperation with other trades with a minimum of disruption or downtime.

N. Refer to Architectural Demolition and/or Alteration plans for actual location of walls, ceilings, etc., being removed and/or remodeled.

SECTION 230593 - TESTING, ADJUSTING, AND BALANCING

PART 1 - GENERAL

1.01 GENERAL REQUIREMENTS

A. The requirements of the General Conditions and Supplementary Conditions apply to all work herein.

B. Section 23 02 00 – Basic Materials and Methods is included as a part of this Section as though written in full in this document.

1.02 RELATED DOCUMENTS

Approved submittal date on equipment installed, to accomplish the test procedures, outlined under paragraph 3.01 of this Section, will be provided by the Contractor.

1.03 DESCRIPTION

A. The TAB of the air conditioning systems shall be performed by an impartial technical firm hired by Owner whose operations are limited only to the field of professional TAB. The TAB work will be done under the direct supervision of a qualified engineer employed by the TAB firm.

B. The TAB firm will be responsible for inspecting, adjusting, balancing, and logging the date on the performance of fans, dampers in the duct system, and air distribution devices. The Contractor and the various Subcontractors of the equipment installed shall cooperate with the TAB firm to furnish necessary data on the design and proper applications of the system components and provide labor and material required to eliminate deficiencies or malperformance.

1.04 QUALITY ASSURANCE

A. QUALIFICATIONS OF CONTRACTOR PERSONNEL: Submit evidence to show that the personnel who shall be in charge of correcting deficiencies for balancing the systems are qualified. The Owner and Engineer reserve the right to require that the originally approved personnel be replaced with other qualified personnel if, in the Owner and Engineer's opinion, the original personnel are not qualified to properly place the system in condition for balancing.

B. QUALIFICATIONS OF TAB FIRM PERSONNEL:

1. A minimum of one registered Professional Engineer licensed in the State, is required to be in permanent employment of the firm.
2. Personnel used on the jobsite shall be either Professional Engineers or technicians, who shall have been permanent, full time employees of the firm for a minimum of six months prior to the start of Work for that specified project.
3. Evidence shall be submitted to show that the personnel who actually

balance the systems are qualified. Evidence showing that the personnel have passed the tests required by the Associated Air Balance Council (AABC) shall be required.

C. CALIBRATION LIST: Submit to the Engineer for approval, a list of the gauges, thermometers, velometer, and other balancing devices to be used in balancing the system. Submit evidence to show that the balancing devices are properly calibrated before proceeding with system balancing.

1.05 OPERATIONS PERSONNEL TRAINING

A. Provide a training session for the owner's operations personnel. Training session shall be performed by a qualified person who is knowledgeable in the subject system/equipment. Submit a training agenda two (2) weeks prior to the proposed training session for review and approval. Training session shall include at the minimum:

1. Purpose of equipment.
2. Principle of how the equipment works.
3. Important parts and assemblies.
4. How the equipment achieves its purpose and necessary operating conditions.
5. Most likely failure modes, causes and corrections.
6. On site demonstration.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 SERVICES OF THE CONTRACTOR

A. The Drawings and Specifications have indicated valves, dampers, and miscellaneous adjustment devices for the purpose of adjustment to obtain optimum operating conditions. Install these devices in a manner that leaves them accessible, and provide access as requested by the TAB firm.

B. Have systems complete and in operational readiness prior to notifying the TAB firm that the project is ready for their services, and certify in writing to the Architect and Owner that such a condition exists.

C. As a part of the Work of this Section, make changes in the sheaves, belts, and dampers or the addition of dampers required for correct balance of the new work as required by the TAB firm, at no additional cost to the Owner.

D. Fully examine the existing system to be balanced, to determine whether or not sufficient volume dampers, balancing valves, thermometers, gauges, pressure and temperature taps, means of reading static pressure and total pressure in duct systems, means of determining water flow, and other means of taking data needed for proper water and air balancing are existing. Submit to the Engineer in writing a listing of omitted items considered necessary to balance existing systems. Submit the list and proposal as a cost add item.

E. Verify that fresh air louvers are free of blockage, coils are clean and fresh air

ducts to each air handling unit have individually adjustable volume regulating dampers.

F. Provide, correct, repair, or replace deficient items or conditions found during the testing, adjusting, and balancing period.

G. In order that systems may be properly tested, balanced, and adjusted as specified, operate the systems at no expense to the Owner for the length of time necessary to properly verify their completion and readiness for TAB period.

H. Project construction schedules shall provide time to permit the successful completion of TAB services prior to Substantial Completion. Complete, operational readiness, prior to commencement of TAB services, shall include the following services of the Contractor:

1. Construction status of building shall permit the closing of doors, windows, ceilings installed and penetrations complete, to obtain project operating conditions.
2. AIR DISTRIBUTION SYSTEMS:
    a. Verify installation for conformity to design. Supply, return, and exhaust ducts terminated and pressure tested for leakage as specified.
    b. Volume and fire dampers properly located and functional. Dampers serving requirements of minimum and maximum outside air, return and relief shall provide tight closure and full opening, smooth and free operation.
    c. Supply, return, exhaust and transfer grilles, registers and diffusers shall be installed.
    d. Air handling systems, units and associated apparatus, such as heating and cooling coils, filter sections, access doors, etc., shall be blanked and sealed to eliminate excessive bypass or leakage of air.
    e. Fans (supply and exhaust) operating and verified for freedom from vibrations, proper fan rotation and belt tension; overload heater elements shall be of proper size and rating; record motor amperage and voltage and verify that these functions do not exceed nameplate ratings.
    f. Furnish or revise fan drives or motors as necessary to attain the specified air volumes.
3. AUTOMATIC CONTROLS:
    a. Verify that control components are installed in accordance with project documents and functional, electrical interlocks, damper sequences, air and water resets, fire and freeze stats.
    b. Controlling instruments shall be functional and set for design operating conditions. Factory precalibration of room thermostats and pneumatic equipment will not be acceptable.
    c. The temperature regulation shall be adjusted for proper relationship between the controlling instruments and calibrated by the TAB Contractor. Advise Engineer of deficiencies or malfunctions.

I. Contractor shall repair any insulation removed from piping system by TAB

Contractor during water balancing.

3.02 SERVICES OF THE TAB FIRM

A. The TAB firm will act as liaison between the Owner, Engineer, and the Contractor and inspect the installation of mechanical piping system, sheet metal work, temperature controls and other component parts of the heating, air conditioning and ventilating systems being retrofitted, repaired, or added under this Contract. The reinspection of the Work will cover that part related to proper arrangement and adequate provision for the testing and balancing and will be done when the Work is 80 percent complete.

B. Upon completion of the installation and start-up of the mechanical equipment, to check, adjust, and balance system components to obtain optimum conditions in each conditioned space in the building. Prepare and submit to the Engineer complete reports on the balance and operations of the systems.

C. Measurements and recorded readings of air, water, and electricity that appear in the reports will be done by the permanently employed technicians or engineers of the TAB firm.

D. Make an inspection in the building during the opposite season from that in which the initial adjustments were made. At the time, make necessary modifications to the initial adjustments required to produce optimum operation of system components to affect the proper conditions as indicated on the Drawings. At time of opposite season check-out, the Owner's representative will be notified before readings or adjustments are made.

E. In fan systems, the air quantities indicated on the Drawings may be varied as required to secure a maximum temperature variation of two degrees within each separately controlled space, but the total air quantity indicated for each zone must be obtained. It shall be the obligation of the Contractor to furnish or revise fan drive and motors if necessary, without cost to the Owner, to attain the specified air volumes.

F. Contractor shall utilize ultrasonic flow meter to balance water flow of existing water system if the original pressure drop data is not available. Contractor shall remove insulation as necessary to use flow meter.

3.03 PROFESSIONAL REPORT

A. Before the final acceptance of the report is made, the TAB firm will furnish the Engineer the following data to be approved by the Owner and Engineer:

1. Summary of main supply, return and exhaust duct pitot tube traverses and fan settings indicating minimum value required to achieve specified air volumes.
2. A listing of the measured air quantities at each outlet corresponding to the temperature tabulation as developed by the Engineer and TAB firm.
3. Air quantities at each return and exhaust air handling device.
4. Static pressure readings entering and leaving each supply fan, exhaust fan, filter, coil, balancing dampers and other components of the

systems. Including the retrofit Work. These readings will be related to performance curves in terms of the CFM handled if available.

5. Motor current readings at each equipment motor on load side of capacitors. The voltages at the time of the reading shall be listed.
6. The final report shall certify test methods and instrumentation used, final velocity reading obtained, temperatures, pressure drops, RPM of equipment, amperage of motors, air balancing problems encountered, recommendations and uncompleted punch list items. The test results will be recorded on standard forms.
7. A summary of actual operating conditions shall be included with each system outlining normal and ventilation cycles of operation. the final report will act as a reference of actual operating conditions for the Owner's operating personnel.

3.04 BALANCING AIR CONDITIONING SYSTEM

A. GENERAL:

1. Place all equipment into full operation, and continue operating during each working day of balancing and testing. If the air conditioning system is balanced during Off-Peak cooling season Contractor shall return to rebalance air side system as required to put system in proper balance at that season.
2. The Contractor shall submit detailed balancing and recording forms for approval. After approval by the Engineer, prepare complete set of forms for recording test data on each system. All Work shall be done under the supervision of a Registered Professional Engineer. All instruments used shall be accurately calibrated to within 1% of scale and maintained in good working order.
3. Upon completion of the balancing and testing, the TAB Contractor shall compile the test data in report forms, and forward five copies to the Engineer for evaluation.
4. The final report shall contain logged results of all tests, including such data as:
    a. Tabulation of air volume at each outlet.
    b. Outside dry bulb and wet bulb temperature.
    c. Inside dry bulb and wet bulb temperatures in each conditioned space room or area.
    d. Actual fan capacities and static pressures. Motor current and voltage readings at each fan.

B. AIR SYSTEMS: Perform the following operations as applicable to balance and test systems:

1. Check fan rotation.
2. Check filters (balancing shall be done with clean filters).
3. Test and adjust blower rpm to design requirements.
4. Test and record motor full load amperes.
5. Test and record system static pressures, suction and discharge.
6. Test and adjust system for design cfm, return air and outside air (±2%). Change-out fan sheaves as required to balance system.
7. Test and record entering air temperatures, db and wb.
8. Test and record leaving air temperatures, db and wb.

9. Adjust all zones to design cfm (±2%).
10. Test and adjust each diffuser, grille, and register to within 5% of design.

C. AIR DUCT LEAKAGE: (From SMACNA Duct Standards latest edition) Test all ductwork (designed to handle over 1000 CFM) as follows:

1. Test apparatus
   The test apparatus shall consist of:
   a. A source of high pressure air--a portable rotary blower or a tank type vacuum cleaner.
   b. A flow measuring device consisting of straightening vanes and an orifice plate mounted in a straight tube with properly located pressure taps. Each orifice assembly shall be accurately calibrated with its own calibration curve. Pressure and flow readings shall be taken with U-tube manometers.
2. Test Procedures
   a. Test for audible leaks as follows:
      1) Close off and seal all openings in the duct section to be tested. Connect the test apparatus to the duct by means of a section of flexible duct.
      2) Start the blower with its control damper closed.
      3) Gradually open the inlet damper until the duct pressure reaches 1.2 times the standard designed duct operating pressure.
      4) Survey all joints for audible leaks. Mark each leak and repair after shutting down blower. Do not apply a retest until sealants have set.
   b. After all audible leaks have been sealed, the remaining leakage should be measured with the orifice section of the test apparatus as follows:
      1) Start blower and open damper until pressure in duct reaches 25% in excess of designed duct operating pressure.
      2) Read the pressure differential across the orifice on manometer No. 2. If there is no leakage, the pressure differential will be zero.
      3) Total allowable leakage shall not exceed one (1) percent of the total system design air flow rate. When partial sections of the duct system are tested, the summation of the leakage for all sections shall not exceed the total allowable leakage.
      4) Even though a system may pass the measured leakage test, a concentration of leakage at one point may result in a noisy leak which must be corrected.

D. DX SYSTEMS:

1. Test and record suction and discharge pressures at each compressor and record ambient air temperature entering the condensing coils.
2. Test and record unit full load amps and voltage.
3. Test and record staging and unloading of unit required by sequence of operation or drawing schedule.

E. Automatic temperature controls shall be calibrated; and all thermostats and dampers adjusted so that the control system is in proper operating condition, subject to the approval of the Engineer/Owner.

F. The TAB Contractor shall report to Engineer all air distribution devices or other equipment that operate noisily so that corrective measures may be implemented by the Contractor at no additional cost to the Owner or Architect/Engineer.

END OF SECTION

SECTION 230713 - DUCT INSULATION

PART 1 - GENERAL

1.01 GENERAL REQUIREMENTS

A. The requirements of the General Conditions and Supplementary Conditions apply to all work herein.

B. Section 23 02 00 - Basic Materials and Methods is included as a part of this Section as though written in full in this document.

1.02 WORK INCLUDED

A. Ductwork system insulation.

1.03 RELATED SECTIONS

A. Section 23 31 13 – Metal Ductwork

1.04 REFERENCE STANDARDS

A. ASTM International. (ASTM)

B. American Society of Heating, Refrigerating, and Air Conditioning Engineers, Inc. (ASHRAE).

C. North American Insulation Manufacturers Association (NAIMA).

D. National Fire Protection Association (NFPA).

E. Sheet Metal and Air Conditioning Contractors National Association, Inc. (SMACNA).

F. Underwriter's Laboratories (UL).

G. Underwriter's Laboratories Environmental (UL Environment).

1.05 QUALITY ASSURANCE

A. Installer’s Qualifications: Firm with at least 5 years successful installation experience on projects with mechanical insulations similar to that required for this project.

B. Flame/Smoke Ratings: Provide composite mechanical insulation (insulation, jackets, coverings, sealers, mastics and adhesives) that is UL Classified per UL 723 or with flame-spread index of 25 or less, and smoke-developed index of 50 or less, as tested by ASTM E 84 (NFPA 255) method.

1. Exception: Outdoor mechanical insulation may have flame spread index of 75 and smoke developed index of 150.

C. Duct and plenum insulation shall comply with minimum R-value requirements of 2015 International Energy Conservation Code and ASHRAE 90.1 - 2013.

D. Adhesive and other material shall comply with NFPA and NBFU Standards No. 90A and 90B.

1.06 WARRANTY

A. Warrant the Work specified herein for one year against becoming unserviceable or causing an objectionable appearance resulting from either defective, or nonconforming materials and workmanship.

B. Defects shall include, but not be limited to, the following:

1. Mildewing.
2. Peeling, cracking, and blistering.
3. Condensation on exterior surfaces.

1.07 SUBMITTALS

A. SHOP DRAWINGS: Indicate size, material, and finish. Show locations and installation procedures. Include details of joints, attachments, and clearances.

B. PRODUCT DATA: Submit schedules, charts, literature, and illustrations to indicate the performance, fabrication procedures, product variations, and accessories.

1.08 DELIVERY, STORAGE AND HANDLING

A. Deliver insulation, coverings, cements, adhesives, and coatings to site in unopened containers with manufacturer’s stamp, clearly labeled with flame and smoke rating, affixed showing fire hazard indexes of products.

B. Protect insulation against dirt, water and chemical and mechanical damage. Do not install damaged or wet insulation; remove such from project site.

PART 2 - PRODUCTS

2.01 GENERAL DESCRIPTION

A. The type of insulation and its installation shall be in strict accordance with these specifications for each service, and the application technique shall be as recommended by the manufacturer. All insulation types, together with adhesives and finishes shall be submitted and approved before any insulation is installed.

B. A sample quantity of each type of insulation and each type of application shall be installed and approval secured prior to proceeding with the main body of the Work.

2.02 ACCEPTABLE MANUFACTURERS

A. Glass mineral wool materials shall be as manufactured by Knauf Insulation,

Certain-Teed, Johns-Manville or Owens-Corning and shall have the same thermal properties, density, fire rating, vapor barrier, etc., as the types specified herein, subject to review by the Engineer.

B. Adhesives shall be as manufactured by Minnesota Mining, Arabol, Benjamin-Foster, Armstrong or Insulmastic, Inc., and shall have the same adhesive properties, fire rating, vapor seal, etc., as the types specified herein, subject to review by the Engineer.

C. Ceramic fiber materials shall be as manufactured by Primer Refractories, A.P. Green Refractories or approved equal.

PART 3 - EXECUTION

3.01 GENERAL

A. All insulation shall be installed in accordance with the manufacturer's recommendations and printed installation instructions.

B. All items required for a complete and proper installation are not necessarily indicated on the plans or in the specifications. Provide all items required as per manufacturer's requirements.

3.02 EXTERNAL DUCT INSULATION

A. Fasten all longitudinal and circumferential laps with outward clinching staples 3" on center. On rectangular ducts over 24" wide apply as above and hold insulation in place on bottom side with mechanical pins and clips on 12" centers.

B. Seal all joints, fastener penetrations and other breaks in vapor barrier with 3-inch wide strips of white glass fabric embedded between two coats of vapor barrier mastic, Childers CP-30 or approved equal.

C. All external duct insulation shall be Knauf Insulation Atmosphere Duct Wrap with ECOSE Technology, Johns Manville Microlite EQ duct wrap insulation with reinforced aluminum facing or approved equal.

D. External duct wrap is required on all outside air ducts, supply and return air ducts that are not internally insulated. External duct wrap is also required on all exhaust and relief air ducts that are used in airside energy recovery systems. Any exhaust ductwork located in an unconditioned space shall also be provided with external duct wrap. Duct wrap shall be provided as follows:

1. 1½” thick, 1.0 PCF density minimum; minimum installed R-value of 4.2 when ducts are located in conditioned spaces.
2. 2” thick with a minimum installed R-value of 6 when ducts are located in unconditioned spaces, such as ceiling plenum space.

E. Any ductwork located in an air plenum that is comprised of materials that do not comply with the 25/50 flame and smoke rating per ASTM E 84 testing requirements shall be provided with a single layer of duct wrap to establish a noncombustible rating per ASTM E 136. Duct wrap products which are

approved for such non-compliant combustible duct materials located in air plenums shall be 3M Fire Barrier Plenum Wrap 5A+ or Unifrax FyreWrap 0.5 Plenum. Insulation products for this application shall be installed in strict accordance with the manufacturer's instructions.

3.03 DUCT LINER

A. Duct liner shall be kept clean and dry during transportation, storage, installation, and throughout the construction process care should be taken to protect the liner from exposure to the elements or damage from mechanical abuse.

B. All portions of duct designed to receive duct liner shall be completely covered with liner as specified. The smooth, black, mat facing or acrylic-coated surfaces with flexible glass cloth reinforcement shall face the airstream. All duct liner shall be cut to assure tight, overlapped corner joints. The top pieces shall be supported by the sidepieces. Duct liner shall be installed following the guidelines in the NAIMA "Duct Liner Installation Standard".

C. The duct liner shall be tested according to erosion test method in ASTM C 1071 and shall be guaranteed to withstand velocities in the duct system up to 6000 fpm without surface erosion.

D. Duct liner shall be adhered to the sheet metal with full coverage of an approved adhesive that conforms to ASTM C 916, and all exposed leading edges and transverse joints shall be coated with Permacote factory-applied or field-applied edge coating and shall be neatly butted without gaps. Shop or field cuts shall be liberally coated with Johns Manville SuperSeal® duct butter and Edge Treatment or approved adhesive.

E. Metal nosings shall be securely installed over transversely oriented liner edges facing the airstream at forward discharge and at any point where lined duct is preceded by unlined duct.

F. When velocity exceeds 4000 fpm (20.3 m/sec), use metal nosing on every leading edge. Nosing may be formed on duct or be channel or zee attached by screws, rivets or welds.

G. The liner shall further be secured with Graham welding pins and washers on not more than 18 inch centers both vertical and horizontal surfaces, and the pins and washers shall be pointed up with adhesive.

H. Duct liner shall be Knauf Insulation Atmosphere Duct Liner with ECOSE Technology, Johns Manville Linacoustic RC duct liner with factory-applied edge coating and acrylic coating on the mat surface of airstream side or approved equal. The liner shall meet the Life Safety Standards as established by NFPA 90A and 90B, FHC 25/50 and Limited Combustibility and the air stream surface coating should contain an immobilized, EPA-registered, anti-microbial agent so it will not support microbial growth as tested in accordance with ASTM G21 and G22. The duct liner shall conform to the requirements of ASTM C 1071, UL 2824, with an NRC not less than .70 as tested per ASTM C 423 using a Type "A" mounting, and a thermal conductivity no higher than 0.24 BTU•in/(hr•ft^2•°F) at 75°F mean temperature.

I. Line supply and return ductwork at connection of HVAC unit to a point of 15 feet upstream and downstream of the equipment and in return air boots. Attach with full cover coat of cement, duct dimensions up to 16 inches; provide stick clips or screws and cap for dimensions over 16 inches, spaced 16 inches o.c. maximum. Provide sheet metal liner cap over all leading edges of internal insulation exposed to air stream.

J. Duct liner shall be provided as follows:

1. 1" Thick, 1.5 PCF density minimum; minimum installed R-value of 4.2 when ducts are located in conditioned spaces.
2. 1 ½" Thick with a minimum installed R-value of 6 when ducts are located in unconditioned spaces, such as ceiling plenum space.
3. 2" Thick with a minimum installed R-value of 8 when ducts are located outdoors.

3.04 AIR DEVICE AND MISCELLANEOUS DUCT INSULATION

A. The backside of all supply air devices shall be insulated with taped and sealed 1½ inch thick external duct wrap.

B. The contractor shall install an additional layer of 1-½ inch thick external glass mineral wool duct wrap on any portion of the supply air, return air, outside air, or exhaust air system that has condensation forming during any period of operation. The insulation shall be taped and vapor-sealed and located until all evidence of the condensation has been eliminated, at no additional cost to the Owner.

END OF SECTION

SECTION 233113 - METAL DUCTWORK

PART 1 - GENERAL

1.01 WORK INCLUDED

A. Low pressure ductwork.

B. Commercial dryer vent.

C. Duct cleaning.

1.02 RELATED SECTIONS

Division 9 - Finishes: Weld priming, weather resistant, paint or coating.

A. Section 23 02 00 - Basic Material and Methods.

B. Section 23 05 93 - Testing, Adjusting and Balancing.

C. Section 23 07 13 - Duct Insulation.

D. Section 23 33 00 - Ductwork Accessories.

E. Section 23 37 13 - Air Distribution Devices.

1.03 QUALITY ASSURANCE

A. Manufacturer’s Qualifications: Firms regularly engaged in manufacture of metal ductwork products of types, materials and sizes required, whose products have been in satisfactory use in similar service for not less than 5 years.

B. Installer’s Qualifications: Firms with least 3 years of successful installation experience on projects with metal ductwork systems similar to that required for project.

C. Codes and Standards:

1. SMACNA Standards: Comply with latest SMACNA’s “HVAC Duct Construction Standards, Metal and Flexible” for fabrication and installation of metal ductwork.
2. ASHRAE Standards: Comply with ASHRAE Handbook, Equipment Volume, Chapter 1 “Duct Construction”, for fabrication and installation of metal ductwork.
3. NFPA Compliance: Comply with NFPA 90A “Standard for the Installation of Air Conditioning and Ventilating Systems”, NFPA 90B “Standard for the Installation of Warm Air Heating and Air Conditioning Systems”, and NFPA 96 Standard.
4. IECC 2000: Comply with 2000 International Energy Conservation Code.

1.04 GENERAL DESCRIPTION

A. Extent of metal ductwork is indicated on drawings and in schedules, and by requirements of this section.

1.05 SUBMITTALS

A. Submit shop drawings, duct fabrication standards and product data under provisions of Division One.

B. Indicate duct fittings, particulars such as gauges, sizes, welds, and configuration prior to start of work.

C. The contract documents are schematic in nature and are to be used only for design intent. The contractor shall prepare sheet metal shop drawings, fully detailed and drawn to scale, indicating all structural conditions, all plumbing pipe and light fixture coordination, and all offsets and transitions as required to permit the duct to fit in the space allocated and built. All duct revisions required as a result of the contractor not preparing fully detailed shop drawings will be performed at no additional cost.

1.06 DEFINITIONS

A. Duct Sizes: Inside clear dimensions. For lined ducts, maintain indicated clear size inside lining. Where offsets or transitions are required, the duct shall be the equivalent size based on constant friction rate.

B. Low Pressure: Low pressure ductwork shall be rated for an operating pressure of 2”. Low pressure ductwork shall be defined as all return, exhaust, and outside air ducts, all supply ductwork associated with constant volume air handling units with a scheduled external static pressure of less than 2”, and all supply ductwork downstream of terminal units in variable volume systems.

C. Medium Pressure: Medium pressure ductwork shall be rated for an operating pressure of 4”. Medium pressure ductwork shall be defined as all supply ductwork extending from variable volume air handling units to terminal units in variable volume systems with air handling units having a scheduled external static pressure of less than 4”. The supply ductwork of constant volume air handling units having a scheduled external static pressure greater than 2” and less than 4” shall be rated for medium pressure.

D. High Pressure: High pressure ductwork shall be rated for an operating pressure of 6”, or the scheduled external pressure of the equipment it is connected to, whichever is greater. The supply ductwork of air handling units having a scheduled external static pressure greater than 4” shall be high pressure.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Protection: Protect shop-fabricated and factory-fabricated ductwork, accessories and purchased products from damage during shipping, storage and handling. Prevent end damage and prevent dirt and moisture from

entering ducts and fittings, use sheet metal end caps on any lined duct exposed to the weather.

B. Storage: Where possible, store ductwork inside and protect from weather. Where necessary to store outside, store above grade and enclose with waterproof wrapping.

PART 2 - PRODUCTS

2.01 DUCTWORK MATERIALS

A. Exposed Ductwork Materials: Where ductwork is indicated to be exposed to view in occupied spaces, provide materials which are free from visual imperfections including pitting, seam marks, roller marks, stains and discolorations, and other imperfections, including those which would impair painting.

B. Sheet Metal.: Except as otherwise indicated, fabricate ductwork from galvanized sheet steel complying with ASTM A 527, lockforming quality, with G 90 zinc coating in accordance with ASTM A 525; and mill phosphatized for exposed locations.

C. Stainless Steel Sheet: Where indicated, provide stainless steel complying with ASTM A167; Type 316; with No. 4 finish where exposed to view in occupied spaces, No. 1 finish elsewhere. Protect finished surfaces with mill-applied adhesive protective paper, maintained through fabrication and installation.

D. Aluminum Sheet: Where indicated, provide aluminum sheet complying with ASTM B 209, Alloy 3003, Temper H14.

2.02 MISCELLANEOUS DUCTWORK MATERIALS

A. General: Non-combustible and conforming to UL 181, Class 1 air duct materials.

B. Flexible Ducts: Flexmaster U.S.A., Inc. Type 3M or approved equal, corrosive resistant galvanized steel formed and mechanically locked to inner fabric with 1” thick insulation when flexible ducts are located in conditioned spaces and with R-5 insulation when located in unconditioned spaces. Flexible duct shall have reinforced metalized outer jacket comply with UL 181, Class 1 air duct.

C. Sealants: Hard-Cast “iron grip” or approved equal, non-hardening, water resistant, fire resistive and shall not be a solvent curing product. Sealants shall be compatible with mating materials, liquid used alone or with tape or heavy mastic.

D. Ductwork Support Materials: Except as otherwise indicated, provide hot-dipped galvanized steel fasteners, anchors, rods, straps, trim and angles for support of ductwork.

1. For exposed stainless steel ductwork, provide matching stainless steel support materials.
2. For aluminum ductwork, provide aluminum support materials.

2.03 LOW PRESSURE DUCTWORK

A. Fabricate and support in accordance with latest SMACNA Duct Construction Standards and ASHRAE handbooks, except as indicated. Provide duct material, gauges, reinforcing, and sealing for operating pressures indicated.

B. Size round ducts installed in place of rectangular ducts in accordance with ASHRAE table of equivalent rectangular and round ducts. No variation of duct configuration or sizes permitted except by approved shop drawings. Obtain engineer's approval prior to using round duct in lieu of rectangular duct.

C. Construct T's, bends, and elbows with radius of not less than 1-1/2 times width of duct on centerline. Where not possible and where rectangular elbows are used, provide airfoil-turning vanes. Where acoustical lining is indicated, provide turning vanes of perforated metal with glass fiber insulation.

D. Increase duct sizes gradually, not exceeding 15 degrees divergence wherever possible. Divergence upstream of equipment shall not exceed 30 degrees; convergence downstream shall not exceed 45 degrees.

E. Use crimp joints with bead for joining round duct sizes 6 inch smaller with crimp in direction of airflow.

F. Use double nuts and lock washers on threaded rod supports.

PART 3 - EXECUTION

3.01 GENERAL INSTALLATION REQUIREMENTS

A. Obtain manufacturer's inspection and acceptance of fabrication and installation of ductwork at beginning of installation.

B. Provide openings in ductwork where required to accommodate thermometers and controllers. Provide pitot tube openings where required for testing of systems, complete with metal can with spring device or screw to ensure against air leakage. Where openings are provided in insulated ductwork, install insulation material inside a metal ring.

C. Locate ducts with sufficient space around equipment to allow normal operating and maintenance activities.

D. Connect terminal units to medium or high pressure ducts with four feet maximum length of flexible duct. Do not use flexible duct to change direction.

E. Connect diffusers or troffer boots to low pressure ducts with 6 feet maximum, 4 feet minimum, length of flexible duct. Hold in place with strap or clamp.

F. During construction provide temporary closures of metal or taped polyethylene on open ductwork to prevent construction dust from entering ductwork system.

G. The interior surface of all ductwork shall be smooth. No sheet metal parts, tabs, angles, or anything else may project into the ducts for any reason, except as specified to be so. All seams and joints shall be external.

H. All ductwork located exposed on roof shall be "crowned" to prevent water from ponding. Ref: Insulation for additional requirements.

I. Where ducts pass through floors, provide structural angles for duct support. Where ducts pass through walls in exposed areas, install suitable sheet metal escutcheons as closers.

J. All angles shall be carried around all four sides of the duct or group of ducts. Angles shall overlap corners and be welded or riveted.

K. All ductwork shall be fabricated in a manner to prevent the seams or joints being cut for the installation of grilles, registers, or ceiling outlets.

L. All duct hangers shall be attached to building structure. Cutting slots in roof or floor decking for hanger straps to be cast in concrete is not acceptable.

3.02 INSTALLATION OF FLEXIBLE DUCTS

A. Maximum Length: For any duct run using flexible ductwork, do not exceed 6'-0" extended length.

B. Installation: Install in accordance with Section III of SMACNA's, "HVAC Duct Construction Standards, Metal and Flexible".

3.03 DUCTWORK APPLICATION SCHEDULE

AIR SYSTEM	MATERIAL
Low Pressure Supply	Galvanized Steel, Aluminum
Return and Relief	Galvanized Steel, Aluminum

3.04 DUCTWORK HANGERS AND SUPPORTS

A. All ductwork shall be properly suspended or supported from the building structure. Hangers shall be galvanized steel straps or hot-dipped galvanized rod with threads pointed after installation. Strap hanger shall be attached to the bottom of the ductwork, provide a minimum of two screws one at the bottom and one in the side of each strap on metal ductwork. The spacing, size and installation of hangers shall be in accordance with the recommendations of the latest SMACNA edition.

B. All duct risers shall be supported by angles or channels secured to the sides of the ducts at each floor with sheet metal screws or rivets. The floor supports may also be secured to ducts by rods, angles or flat bar to the duct joint or reinforcing. Structural steel supports for duct risers shall be provided under this Division.

3.05 AIR DUCT LEAKAGE: (From SMACNA Duct Standards Latest Edition) Test all ductwork (designed to handle over 1000 CFM) as follows:

A. Test apparatus

The test apparatus shall consist of:

1. A source of high pressure air--a portable rotary blower or a tank type vacuum cleaner.
2. A flow measuring device consisting of straightening vanes and an orifice plate mounted in a straight tube with properly located pressure taps. Each orifice assembly shall be accurately calibrated with its own calibration curve. Pressure and flow readings shall be taken with U-tube manometers.

B. Test Procedures

1. Test for audible leaks as follows:
2. Close off and seal all openings in the duct section to be tested. Connect the test apparatus to the duct by means of a section of flexible duct.
   a. Start the blower with its control damper closed.
   b. Gradually open the inlet damper until the duct pressure reaches 1.5 times the standard designed duct operating pressure.
   c. Survey all joint for audible leaks. Mark each leak and repair after shutting down blower. Do not apply a retest until sealants have set.
3. After all audible leaks have been sealed, the remaining leakage should be measured with the orifice section of the test apparatus as follows:
   a. Start blower and open damper until pressure in duct reaches 50% in excess of designed duct operating pressure.
   b. Read the pressure differential across the orifice on manometer No. 2. If there is no leakage, the pressure differential will be zero.
   c. Total allowable leakage shall not exceed one (1) percent of the total system design air flow rate. When partial sections of the duct system are tested, the summation of the leakage for all sections shall not exceed the total allowable leakage.
   d. Even though a system may pass the measured leakage test, a concentration of leakage at one point may result in a noisy leak which, must be corrected.
4. Testing Report
   a. Contractor shall provide a testing report for each air system to the engineer. The report shall indicate the completion of testing and compliance with testing specification.
   b. All duct testing reports shall be included in the final close out documents.

3.06 DUCT SYSTEM CLEANING

A. Duct system cleaning shall be performed in accordance with the current published standards of ASHRAE and NADCA.

B. Duct system cleaning method used shall incorporate the use of vacuum collection devices that are operated continuously during cleaning. A vacuum device shall be connected to the downstream end of the section being cleaned through a predetermined opening. The vacuum collection device must be of sufficient power to render all areas being cleaned under negative pressure, such that containment of debris and the protection of the indoor environment is assured.

C. All vacuum devices exhausting air inside the building shall be equipped with HEPA filters (minimum efficiency), including hand-held vacuums and wet-vacuums.

D. All vacuum devices exhausting air outside the facility shall be equipped with Particulate Collection including adequate filtration to contain debris removed from the HVAC system. Such devices shall exhaust in a manner that will not allow contaminants to re-enter the facility. Release of debris outdoors must not violate any outdoor environmental standards, codes or regulations.

E. Fibrous glass thermal or acoustical insulation elements present in any equipment or ductwork shall be thoroughly cleaned with HEPA vacuuming equipment, while the HVAC system is under constant negative pressure, and not permitted to get wet in accordance with applicable NADCA and NAIMA standards and recommendations.

F. Duct cleaning method used shall not damage the integrity of the ductwork, nor damage porous surface materials such as liners inside the ductwork or system components.

G. Replace the fiberglass material if there is any evidence of damage, deterioration, delamination, friable material, mold or fungus growth, or moisture such that fibrous glass materials cannot be restored by cleaning or resurfacing with an acceptable insulation repair coating.

H. Clean external surfaces of foreign substances which might cause corrosive deterioration of metal or, where ductwork is to be painted, might interfere with painting or cause paint deterioration.

I. Strip protective paper from stainless ductwork surfaces, and repair finish wherever it has been damaged.

J. Temporary Closure: At ends of ducts which are not connected to equipment or air distribution devices at time of ductwork installation, provide temporary closure of polyethylene film or other covering which will prevent entrance of dust and debris until time connections are to be completed.

K. Cleaning Report: Contractor shall provide a report to the Owner indicating the completion of duct cleaning per specification and areas of the duct system found to be damaged and/or in need of repair.

3.07 DUCT JOINTS AND SEAMS

A. Seal all non-welded duct joints with duct sealant as indicated.

END OF SECTION

SECTION 233300 – DUCTWORK ACCESSORIES

PART 1 – GENERAL

1.01 WORK INCLUDED

A. Volume control dampers.

B. Round Duct Taps.

C. Fire dampers.

D. Back draft dampers.

E. Air turning devices.

F. Flexible duct connections.

G. Duct access doors.

H. Duct test holes.

1.02 RELATED WORK

A. Section 23 05 48 - Vibration and Seismic Controls for HVAC Piping and Equipment.

B. Section 23 31 13 - Metal Ductwork.

1.03 REFERENCES

A. NFPA 90A - Installation of Air Conditioning and Ventilating Systems.

B. SMACNA - Low Pressure Duct Construction Standards.

C. UL 33 - Heat Responsive Links for Fire-Protection Service.

D. UL 555 - Fire Dampers and Ceiling Dampers.

1.04 SUBMITTALS

A. Submit shop drawings and product data under provisions of Division One.

B. Provide shop drawings for shop fabricated assemblies indicated, including volume control dampers duct access doors duct test holes. Provide product data for hardware used.

C. Submit manufacturer's installation instructions under provisions of Division 1, for fire dampers and combination fire and smoke dampers.

PART 2 - PRODUCTS

2.01 VOLUME CONTROL DAMPERS

A. Fabricate in accordance with SMACNA Low Pressure Duct Construction Standards, and as indicated.

B. Fabricate splitter dampers of material same gauge as duct to 24 inches size in either direction, and two gauges heavier for sizes over 24 inches.

C. Fabricate splitter dampers of double thickness sheet metal to streamline shape. Secure blade with continuous hinge or rod. Operate with minimum 1/2 inch diameter rod in self aligning, universal joint, action flanged bushing, with set screw.

D. Fabricate single blade dampers for duct sizes to 9-1/2 x 24 inch.

E. Fabricate multi-blade damper of opposed blade pattern with maximum blade sizes 12 x 72 inch.

1. Assemble center and edge crimped blades in prime coated or galvanized channel frame with suitable hardware.
2. On outside air, return air, and all other dampers required to be low leakage type, provide galvanized blades and frames, seven inches wide maximum, with replaceable vinyl, EPDM, silicone rubber seals on blade edges and stainless steel side seals. Provide blades in a double sheet corrugated type construction for extra strength. Provide hat channel shape frames for strength and blade linkage enclosure to keep linkage out of the air stream. Construction leakage not to exceed 1/2%, based on 2,000 fpm and 4 inch static pressure.

F. Except in round ductwork 12 inches and smaller, provide end bearings. On multiple blade dampers, provide oil-impregnated nylon or sintered bronze bearings.

G. Provide locking, indicating quadrant regulators on single and multi-blade dampers. Where rod lengths exceed 30 inches provide regulator at both ends.

H. On insulated ducts mount quadrant regulators on stand-off mounting brackets, bases, or adapters.

2.02 ROUND DUCT TAPS

A. Taps to trunk duct for round flexible duct shall be spin-in fitting with locking quadrant butterfly damper, model no. FLD-B03 by Flexmaster or approved equal.

2.03 ACCEPTABLE MANUFACTURERS - FIRE DAMPERS

A. Greenheck.

B. Louvers and Dampers Inc.

C. Ruskin.

D. Nailor Industries.

E. Pottorff

2.04 FIRE DAMPERS

A. Fabricate in accordance with NFPA 90A and UL 555, and as indicated.

B. Provide curtain type dampers of galvanized steel with interlocking blades. Provide stainless steel closure springs and latches for horizontal installations. Configure with blades out of air stream.

C. Fabricate multiple blade fire dampers per U.L. with 16 gauge minimum galvanized steel frame and blades, oil-impregnated bronze or stainless steel sleeve bearings and plated steel axles, 1/8 x 1/2 inch plated steel concealed linkage, stainless steel closure spring, blade stops, and lock.

D. Fusible links, UL 33, shall separate at 160 degrees F. Provide adjustable link straps for combination fire/balancing dampers.

2.05 ACCEPTABLE MANUFACTURERS – BACKDRAFT DAMPERS

A. Greenheck

B. American Warming and Vent.

C. Louvers and Dampers Inc.

D. Ruskin.

E. Pottorff

F. Substitutions: Under provisions of Division One.

2.06 BACKDRAFT DAMPERS

A. Gravity back draft dampers, size 18 x 18 inches or smaller, furnished with air moving equipment, may be air moving equipment manufacturers standard construction.

B. Fabricate multi-blade, parallel action gravity balanced back draft dampers of 16 gauge galvanized steel, or extruded aluminum, with blades of maximum 6 inch width, with felt or flexible vinyl sealed edges, linked together in rattle-free manner with 90 degree stop, steel ball bearings, and plated steel pivot pin; adjustment device to permit setting for varying differential static pressure.

2.07 ACCEPTABLE MANUFACTURERS – AIR TURNING DEVICES

A. Young Regulator.

B. Titus.

C. Tuttle and Bailey.

D. Substitutions: Under provisions of Division One.

2.08 AIR TURNING DEVICES

A. On duct sizes less than 12 x 12, multi-blade device with blades aligned in short dimension; steel or aluminum construction; with individually adjustable blades, mounting straps.

B. Multi-blade device with radius blades attached to pivoting frame and bracket, steel or aluminum construction, with worm drive mechanism with 18 inch long removable key operator.

2.09 ACCEPTABLE MANUFACTURERS – FLEXIBLE DUCT CONNECTIONS

A. Metaledge.

B. Ventglass.

C. Substitutions: Under provisions of Division One.

2.10 FLEXIBLE DUCT CONNECTIONS TO AIR MOVING EQUIPMENT

A. Fabricate in accordance with SMACNA Low Pressure Duct Construction Standards, and as indicated.

B. UL listed fire-retardant neoprene coated woven glass fiber fabric to NFPA 90A, minimum density 20 oz per sq yd, approximately 6 inches wide, crimped into metal edging strip.

2.11 ACCEPTABLE MANUFACTURERS – DUCT ACCESS DOORS

A. Greenheck.

B. American Warming and Vent.

C. Ruskin.

D. Titus.

E. Substitutions: Under provisions of Division One.

2.12 DUCT ACCESS DOORS

A. Fabricate in accordance with SMACNA Low Pressure Duct Construction Standards and as indicated.

B. Review locations prior to fabrication.

C. Fabricate rigid and close-fitting doors of galvanized steel with sealing gaskets and quick fastening locking devices. For insulated ductwork, install minimum one inch thick insulation with sheet metal cover. Insulation shall be replaceable without field cutting or patching.

D. Access doors smaller than 12 inches square may be secured with sash locks.

E. Provide two hinges and two sash locks for sizes up to 18 inches square, three hinges and two compression latches with outside and inside handles for sizes up to 24 x 48 inches. Provide an additional hinge for larger sizes.

F. Access doors with sheet metal screw fasteners are not acceptable.

2.13 DUCT TEST HOLES

A. Cut or drill temporary test holes in ducts as required. Cap with neat patches, neoprene plugs, threaded plugs, or threaded or twist-on metal caps.

B. Permanent test holes shall be factory fabricated, air tight flanged fittings with screw cap. Provide extended neck fittings to clear insulation.

PART 3 – EXECUTION

3.01 INSTALLATION

A. Install accessories in accordance with manufacturer's instructions.

B. Balancing Dampers

1. Provide at points on low pressure supply, return, and exhaust systems where branches are taken from larger ducts and as required for air balancing. Use splitter dampers only where indicated.
2. All regulators mounted on externally insulated ductwork shall have 16 gauge elevated platforms at least 1/8 inch higher than the thickness of the insulation. Damper shaft shall have Ventlock No. 607 bearing mounted on ductwork within elevated platform. If duct is inaccessible the operating handle shall be extended and the regulator installed on the face of the wall or ceiling. Where regulators are exposed in finished parts of the building, they shall be flush type, Ventlock No. 666. All regulators shall be manufactured by Ventlock, or approved equal.
3. All dampers in lined ductwork shall have bushing to prevent damper damage to liner.

C. Provide fire dampers at locations indicated, where ducts and outlets pass through fire rated components, and where required by authorities having jurisdiction. Install with required perimeter mounting angles, sleeves, breakaway duct connections, corrosion resistant springs, bearings, bushings and hinges.

D. Demonstrate re-setting of fire dampers to authorities having jurisdiction and Owner's representative.

E. Provide back draft dampers on exhaust fans or exhaust ducts nearest to outside and where indicated.

F. Provide flexible duct connections immediately adjacent to equipment in ducts

associated with fans and motorized equipment. Provide at least one inch slack at all flexible duct connections.

G. Provide duct access doors for inspection and cleaning before and after filters, coils, fans, automatic dampers, at fire dampers, and elsewhere as indicated. Provide minimum 8 x 8-inch size for hand access, 18 x 18 inch size for shoulder access, and as indicated.

H. Provide duct test holes where indicated and required for testing and balancing purposes.

END OF SECTION

SECTION 260200 - BASIC MATERIALS AND METHODS

PART 1 - GENERAL

1.01 GENERAL REQUIREMENTS

A. The Contract Drawings indicate the extent and general arrangement of the systems. If any departure from the Contract Drawings are deemed necessary by the Contractor, details of such departures and the reasons therefore, shall be submitted to the Architect for approval as soon as practicable. No such departures shall be made without the prior written approval of the Architect.

1.02 SCOPE OF WORK

A. The Work included under this Contract consists of the furnishing and installation of all equipment and material necessary and required to form the complete and functioning systems in all of its various phases, all as shown on the accompanying Drawings and/or described in these Specifications. The contractor shall review all pertinent drawings, including those of other contracts prior to commencement of Work.

1.03 REFERENCES

A. National Electrical Code (NEC)

B. American Society for Testing and Materials (ASTM)

C. Underwriter's Laboratories, Inc. (UL)

D. Insulated Cable Engineer's Association (ICEA).

E. National Electrical Manufacturer's Association (NEMA).

F. Institute of Electrical and Electronic's Engineers (IEEE).

G. American National Standards Institute (ANSI).

H. National Fire Protection Association (NFPA).

I. International Energy Conservation Code (IECC).

1.04 COMPLETE FUNCTIONING OF WORK:

A. All work fairly implied as essential to the complete functioning of the electrical systems shown on the Drawings and Specifications shall be completed as part of the work of this Division unless specifically stated otherwise. It is the intention of the Drawings and Specifications to establish the types of the systems, but not set forth each item essential to the functioning of the system. In case of doubt as to the work intended, or in the event of amplification or clarification thereof, the Contractor shall call upon the Architect for supplementary instructions, Drawings, etc.

1.05 SCHEMATIC NATURE OF CONTRACT DOCUMENTS

A. The contract documents are schematic in nature in that they are only to establish scope and a minimum level of quality. They are not to be used as actual working construction drawings. The actual working construction drawings shall be the approved shop drawings.

1.06 CONTRACTOR'S QUALIFICATIONS

A. An approved contractor for the work under this division shall be:

1. A specialist in this field and have the personnel, experience, training, and skill, and the organization to provide a practical working system.
2. Able to furnish evidence of having contracted for and installed not less than 3 systems of comparable size and type that have served their Owners satisfactorily for not less than 3 years.
3. Perform work by persons qualified to produce workmanship of specified quality. Persons performing electrical work shall be required to be licensed. Onsite supervision, journeyman shall have minimum of journeyman license. Helpers, apprentices shall have minimum of apprentice license.

1.07 DATE OF FINAL ACCEPTANCE

A. The date of final acceptance shall be the date of owner occupancy, or the date all punch list items have been completed or final payment has been received. Refer to Division One for additional requirements.

B. The date of final acceptance shall be documented in writing and signed by the architect, owner and contractor.

1.08 SUBMITTALS

A. Coordinate with Division 01 for submittal timetable requirements, unless noted otherwise within thirty (30) days after the Contract is awarded. The Contractor shall submit an electronic copy of a complete set of shop drawings and complete data covering each item of equipment or material. The submittal of each item requiring a submittal must be received by the Architect or Engineer within the above thirty day period. The Architect or Engineer shall not be responsible for any delays or costs incurred due to excessive shop drawing review time for submittals received after the thirty (30) day time limit. The Architect and Engineer will retain a copy of all shop drawings for their files. All literature pertaining to items subject to Shop Drawing submittal shall be submitted at one time. Submittals shall be placed in one electronic file in PDF 8.0 format and bookmarked for individual specification sections. Individual electronic files of submittals for individual specifications shall not be permitted. Each submittal shall include the following items:

1. A cover sheet with the names and addresses of the Project, Architect, MEP Engineer, General Contractor and the Subcontractor making the submittal. The cover sheet shall also contain the section number covering the item or items submitted and the item nomenclature or description.

2. An index page with a listing of all data included in the Submittal.
3. A list of variations page with a listing all variations, including unfurnished or additional required accessories, items or other features, between the submitted equipment and the specified equipment. If there are no variations, then this page shall state "NO VARIATIONS". Where variations affect the work of other Contractors, then the Contractor shall certify on this page that these variations have been fully coordinated with the affected Contractors and that all expenses associated with the variations will be paid by the submitting Contractor. This page will be signed by the submitting Contractor.
4. Equipment information including manufacturer's name and designation, size, performance and capacity data as applicable. All applicable Listings, Labels, Approvals and Standards shall be clearly indicated.
5. Dimensional data and scaled drawings as applicable to show that the submitted equipment will fit the space available with all required Code and maintenance clearances clearly indicated and labeled at a minimum scale of 1/4" = 1'-0", as required to demonstrate that the alternate or substituted product will fit in the space available.
6. Identification of each item of material or equipment matching that indicated on the Drawings.
7. Sufficient pictorial, descriptive and diagrammatic data on each item to show its conformance with the Drawings and Specifications. Any options or special requirements or accessories shall be so indicated. All applicable information shall be clearly indicated with arrows or another approved method.
8. Additional information as required in other Sections of this Division.
9. Certification by the General Contractor and Subcontractor that the material submitted is in accordance with the Drawings and Specifications, signed and dated in long hand. Submittals that do not comply with the above requirements shall be returned to the Contractor and shall be marked "REVISE AND RESUBMIT".

B. Equipment and materials submittals and shop drawings will be reviewed for compliance with design concept only. It will be assumed that the submitting Contractor has verified that all items submitted can be installed in the space allotted. Review of shop drawings and submittals shall not be considered as a verification or guarantee of measurements or building conditions.

C. Where shop drawings and submittals are marked "REVIEWED", the review of the submittal does not indicate that submittals have been checked in detail nor does it in any way relieve the Contractor from his responsibility to furnish material and perform work as required by the Contract Documents.

D. Shop drawings shall be reviewed and returned to the Contractor with one of the following categories indicated:

1. REVIEWED: Contractor need take no further submittal action, shall include this submittal in the O&M manual and may order the equipment submitted on.
2. REVIEWED AS NOTED: Contractor shall submit a letter verifying that required exceptions to the submittal have been received and complied with including additional accessories or coordination action as noted,

and shall include this submittal and compliance letter in the O&M manual. The contractor may order the equipment submitted on at the time of the returned submittal providing the Contractor complies with the exceptions noted.

3. NOT APPROVED: Contractor shall resubmit new submittal on material, equipment or method of installation when the alternate or substitute is not approved, the Contractor will automatically be required to furnish the product, material or method named in the Specifications and/or drawings. Contractor shall not order equipment that is not approved. Repetitive requests for substitutions will not be considered.
4. REVISE AND RESUBMIT: Contractor shall resubmit new submittal on material, equipment or method of installation when the alternate or substitute is marked revise and resubmit, the Contractor will automatically be required to furnish the product, material or method named in the Specifications and/or provide as noted on previous shop drawings. Contractor shall not order equipment marked revise and resubmit. Repetitive requests for substitutions will not be considered.
5. CONTRACTOR'S CERTIFICATION REQUIRED: Contractor shall resubmit submittal on material, equipment or method of installation. The Contractor's stamp is required stating the submittal meets all conditions of the contract documents. The stamp shall be signed by the General Contractor. The submittal will not be reviewed if the stamp is not placed and signed on all shop drawings.
6. MANUFACTURER NOT AS SPECIFIED: Contractor shall resubmit new submittal on material, equipment or method of installation when the alternate or substitute is marked manufacturer not as specified, the Contractor will automatically be required to furnish the product, material or method named in the specifications. Contractor shall not order equipment where submittal is marked manufacturer not as specified. Repetitive requests for substitutions will not be considered.

E. Materials and equipment which are purchased or installed without shop drawing review shall be at the risk of the Contractor and the cost for removal and replacement of such materials and equipment and related work which is judged unsatisfactory by the Owner or Engineer for any reason shall be at the expense of the Contractor. The responsible Contractor shall remove the material and equipment noted above and replace with specified equipment or material at his own expense when directed in writing by the Architect or Engineer.

F. Shop Drawing Submittals shall be complete and checked prior to submission to the Engineer for review.

G. Furnish detailed shop drawings, descriptive literature, physical data and a specification critique for each section indicating "compliance" and/or "variations" for the following items:

Panelboards
Disconnect Switches
Lighting Fixtures
Fire Alarm System

1.09 RECORD DRAWINGS

A. Maintain a continuous record during the course of construction of all changes and deviations in the work from the contract drawings. Upon completion of the work, purchase a set of "Auto Positive Tracings" on vellum and make corrections as required to reflect the electrical systems as installed. Location and size of all conduit shall be accurately shown to dimension. Submit three prints of the tracings for approval. Make corrections to tracings as directed and deliver "Auto Positive Tracings" to the Architect. Record drawings shall be furnished in addition to shop drawings. Symbols on the Record drawings shall correspond to the identification symbols on the contract drawings and equipment identification plates and tags.

B. The Contractor shall maintain a set of clearly marked black line record "AS-BUILT" prints on the job site on which he shall mark all work details, alterations to meet site conditions and changes made by "Change Order" notices. These shall be kept available for inspection by the Owner, Architect or Engineer at all times.

1.10 SITE VISITATION

A. Visit the site of the proposed construction in order to fully understand the facilities, difficulties and restriction attending the execution of the work.

B. Before submitting a bid, it will be necessary for each Contractor whose work is involved to visit the site and ascertain for himself the conditions to be met therein in installing his work and make due provision for same in his bid. It will be assumed that this Contractor in submitting his bid has visited the premises and that his bid covers all work necessary to properly install the equipment shown. Failure on the part of the Contractor to comply with this requirement shall not be considered justification for the omission or faulty installation of any work covered by these Specifications and Drawings.

1.11 WARRANTY

A. The undertaking of the work described in this Division shall be considered equivalent to the issuance, as part of this work, of a specific guarantee extending one year beyond the date of completion of work and acceptance by Owner, against defects in materials and workmanship. Materials, appliances and labor necessary to effect repairs and replacement so as to maintain said work in good functioning order shall be provided as required. Replacements necessitated by normal wear in use or by Owner's abuse are not included under this guarantee.

PART 3 - EXECUTION

3.01 WORKMANSHIP AND CONCEALMENT

A. The work of this Section shall be performed by workman skilled in their trade. Installation shall be consistent in completeness whether concealed or exposed. Each item of electrical work shall be concealed in walls, chases, under floors and above ceilings except:

1. Where shown to be exposed.
2. Where exposure is necessary to the proper function.

3.02 ELECTRICAL GEAR

A. Install all electrical equipment in accordance with the National Electrical Code and as shown on the drawings.

3.03 CLEANING

A. Clean lighting fixtures and equipment.

B. Touch-up and refinish scratches and marred surfaces on panels, switches, starters, and transformers.

END OF SECTION

SECTION 260313 - ELECTRICAL DEMOLITION FOR REMODELING

PART 1 – GENERAL

1.01 SECTION INCLUDES

A. Electrical demolition.

B. The contractor shall be responsible for loss or damage to the existing facilities caused by him and his workmen, and shall be responsible for repairing such loss or damage. The contractor shall send proper notices, make necessary arrangements, and perform other services required for the care, protection and in-service maintenance of all electrical services for the new and existing facilities. The contractor shall erect temporary barricades, with necessary safety devices, as required to protect personnel from injury, removing all such temporary protection upon completion of the work.

PART 2 – PRODUCTS

2.01 MATERIALS AND EQUIPMENT

A. Include in the contract price all rerouting of existing conduits, wiring, outlet boxes, fixtures, etc., and the reconnecting of existing fixtures as necessitated by field conditions to allow the installation of the new systems. Furnish all temporary conduit, wiring, boxes, etc., as required to maintain lighting and power service for the existing areas with a minimum of interruption. Remove wire and conduit back to nearest accessible active junction box and extend to existing homeruns as required.

PART 3 – EXECUTION

3.01 PREPARATION

A. Disconnect electrical systems in walls, floors, and ceilings scheduled for removal.

B. Coordinate utility service outages with Utility Company.

C. Provide temporary wiring and connections to maintain existing systems in service during construction. When work must be performed on energized equipment or circuits use personnel experienced in such operations.

D. Existing Electrical Service: Maintain existing system in service until new system is complete and ready for service. Disable system only to make switchovers and connections. Obtain permission from Owner at least 24 hours before partially or completely disabling system. Minimize outage duration. Make temporary connections to maintain service in areas adjacent to work area.

E. Existing Fire Alarm System: Maintain existing system in service until new system is accepted. Disable system only to make switchovers and connections. Notify Owner and local fire service at least 24 hours before partially or completely disabling system. Minimize outage duration. Make

temporary connections to maintain service in areas adjacent to work area.

3.02 DEMOLITION AND EXTENSION OF EXISTING ELECTRICAL WORK

A. Remove, relocate, and extend existing installations to accommodate new construction.

B. Remove exposed abandoned conduit, including abandoned conduit above accessible ceiling finishes. Cut conduit flush with walls and floors, and patch surfaces.

C. Disconnect abandoned outlets and remove devices. Remove abandoned outlets if conduit servicing them is abandoned and removed. Provide blank cover for abandoned outlets, which are not removed.

D. Disconnect and remove electrical devices and equipment serving utilization equipment that has been removed.

E. Disconnect and remove abandoned luminaires. Remove brackets, stems, hangers, and other accessories.

3.03 CLEANING AND REPAIR

A. Clean and repair existing materials and equipment which remain or are to be reused.

B. Panelboards: Clean exposed surfaces and check tightness of electrical connections. Replace damaged circuit breakers and provide closure plates for vacant positions. Provide typed circuit directory showing revised circuiting arrangement.

3.04 REMOVAL OF MATERIALS

A. The contractor shall modify, remove, and/or relocate all materials and items so indicated on the drawings or required by the installation of new facilities. All removals and/or dismantling shall be conducted in a manner as to produce maximum salvage. Salvage materials shall remain the property of the Owner, and shall be delivered to such destination as directed by the Owner. Materials and/or items scheduled for relocation and which are damaged during dismantling or reassembly operations shall be repaired and restored to good operative condition. The contractor may, at his discretion and upon the approval of the Owner, substitute new materials and/or items of like design and quality in lieu of materials and/or items to be relocated.

END OF SECTION

SECTION 260519 - WIRE, CABLE AND RELATED MATERIALS

PART 1 - GENERAL

1.01 SCOPE

A. Provide 600 volt building wire, cable and connectors and 300 volt wire, cable and connectors.

B. WORK INCLUDED: Include the following Work in addition to items normally part of this Section.

1. Wiring for lighting and power.
2. Connection of equipment shown.

1.02 STANDARDS

A. UL83

B. ASTM B-3

C. All wire cable and connectors shall be UL approved.

1.03 ACCEPTABLE MANUFACTURERS

A. 600 VOLT WIRE AND CABLE

1. Southwire
2. Encore
3. Cerro

B. 300 VOLT WIRE AND CABLE

1. Westpenn
2. Beldon
3. Alpha
4. Tappan - Southwire

1.04 SUBMITTALS

1. Cutsheets of wire, cable and connectors to indicate the performance, fabrication procedures, product variations, and accessories.

1.05 REQUIREMENTS OF REGULATORY AGENCIES WORK IN ACCORDANCE WITH:

A. National Electrical Code.

B. Local, municipal, or state codes that have jurisdiction.

PART 2 - PRODUCTS

2.01 WIRING

A. WIRE MATERIAL: Conductors shall be soft drawn, annealed copper. Aluminum wiring is not acceptable unless otherwise noted on drawings.

B. TYPES:

1. Provide type "THHN/THWN-2" insulation for all buried feeders and service entrance conductors.
2. Provide type "THHN/THWN-2" insulation for all branch circuits and above grade feeders.
3. All wire No. 8 and larger shall be stranded. All wire No. 10 and smaller shall be stranded or solid.
4. Provide type "XHHW" or other 90 degrees insulation wiring for branch circuit wiring installed through continuous rows of fluorescent fixture bodies.
5. All 300-volt cable including but not limited to telephone, fire alarm, data, CATV and security shall be UL listed for use in return air plenums.

C. CONDUCTOR SIZES

1. Branch circuit conductors shall be sized for a maximum 3% drop in the rated voltage to the longest outlet on the circuit.
2. Minimum wire shall be No. 12, unless otherwise shown on Drawings or required by Code.

D. COLOR CODING: No. 6 or larger shall use tape for color coding. No. 8 and smaller wire shall be color coded in accordance with the governing authority requirements or as follows:

120/208 Volt	277/480 Volt	120/240 Volt
Neutral: White	Neutral: Gray	Neutral: White
Phase A: Black	Phase A: Brown	Phase A: Black
Phase B: Red	Phase B: Purple	Phase B: Orange
Phase C: Blue	Phase C: Yellow	Phase C: Blue
Ground: Green	Ground: Green	Ground: Green

2.02 GROUNDING

Permanently connect all conduit work, motors, starters, and other electrical equipment to grounding system in accordance with the National Electrical Code.

END OF SECTION

SECTION 260526 - GROUNDING

PART 1 - GENERAL

1.01 GENERAL REQUIREMENTS

A. The requirements of the General Conditions and Supplementary Conditions apply to all work herein.

1.02 SCOPE

A. WORK COMBINED WITH OTHER SECTIONS: Combine the work specified herein with the following Sections to form a single responsibility for the Work:

1. Electrical.
2. Basic materials and methods.

B. Provide electrical service, equipment and wiring device grounding as shown, scheduled and as specified.

C. The types of grounding include, but not limited to, the grounding bonding of all equipment devices, building steel piping, and as required by the National Electrical Code, Local Inspection Department and Power Company.

1.03 STANDARDS

A. NATIONAL ELECTRICAL CODE (NFPA-70)

B. Local municipal and State codes that have jurisdiction.

C. NECA

1.04 ACCEPTABLE MANUFACTURES

A. Provide grounding products manufactured by Copperweld and Cadweld.

1.05 SUBMITTALS

A. Shop drawings shall include, but not limited to the following:

1. Cut sheets of ground rods, clamps and connectors.
2. Grounding system diagram.

PART 2 - PRODUCTS

A. GENERAL: Provide all materials required to construct a complete grounded electrical system.

B. GROUND RODS: Ground rods shall be 3/4" inch diameter by 10 feet long construction with copper jacket and a steel core.

C. CLAMPS: Ground clamps shall be copper except for steel or iron pipes in

which the clamps shall be galvanized iron.

D. CONDUCTORS: Conductors shall be connected by means of an approved pressure connector or clamp.

PART 3 - EXECUTION

3.01 INSTALLATION

A. GENERAL: Install grounding system as shown and specified to ensure a properly grounded system.

B. SERVICE ENTRANCE GROUNDING SYSTEM: Provide a main bonding jumper between the neutral and ground bus of each switchboard. Route a separate grounding electrode conductor in conduit from each main distribution panel to the ground rod grid, incoming cold water piping system. Provide a bonding jumper around water meter. The grounding electrode conductor shall be stranded copper, 98% conductivity and shall be run continuous without splices or joints and installed at least 12" below grade.

C. BUILDING STEEL AND PIPING SYSTEM: Install a bonding jumper between building steel and metallic piping systems to bond them to the electrical grounding system.

D. NEUTRAL: The neutral shall be grounded only at the service entrance and other separately derived systems. The neutral shall be kept separate from the grounding system and shall not be used as a ground.

E. GROUNDING CONDUCTOR: A grounding conductor and metallic conduit system shall bond all equipment served by the electrical system. Provide a flexible bonding jumper for isolated metallic piping and ductwork and around expansion fittings and joints.

F. LIGHTING FIXTURES: Flexible fixture whips containing a green grounding conductor shall be used to connect light fixtures. Flexible fixture whips shall not exceed ten feet.

G. RECEPTACLES: All receptacles shall be grounded using the branch circuit grounding conductor. Receptacles shall use an approved grounding yoke.

3.02 TESTING: Perform a ground resistance test using a biddle analog or digital portable earth/ground resistance tester. The system resistance shall not exceed 5 OHMS. Provide additional electrodes as required (refer to 250-84 of the NEC or the most current edition 250-56). Test shall not be conducted following wet weather. Provide personal instruments to conduct these tests and submit certified test for review. Test shall be verified by Engineer.

END OF SECTION

SECTION 260533 - RACEWAYS

PART 1 - GENERAL

1.01 SCOPE

A. Provide electrical raceways and fittings as shown, scheduled and specified.

B. The types of raceways and fittings required are as follows:

1. Intermediate hot-dipped galvanized steel conduit (IMC)
2. Electrical metallic tubing (EMT)

1.02 STANDARDS

A. ANSI, C80.1 & C80.3

B. NEMA FB-1

C. NEMA TC3

D. UL, 6, 797 & 1242

1.03 SUBMITTALS

A. Product data shall include but not be limited to:

1. Cutsheets for raceways, fitting, solvents, primers, etc.

1.04 REQUIREMENTS OF REGULATORY AGENCIES WORK IN ACCORDANCE WITH:

A. National Electrical Code.

B. Local, municipal, or state codes that have jurisdiction.

PART 2 – PRODUCTS

2.01 WIREWAYS

A. Wireways shall be made of not less than 16-gauge sheet steel for 4 inch and 6 inch square sizes and 14 gauge steel for 8 inch and 12 inch square sizes. Couplings end plates, and knockouts shall be furnished as required. Each section of wireways shall be rigidly supported.

B. The finish shall be ANSI-49 gray epoxy paint applied by a cathodic electrode position paint process over a corrosion resistant phosphate preparation for NEMA 1 wireways. Provide galvanized steel for NEMA 3R wireways. NEMA 3R wireways and auxiliary gutters are for horizontal mounting only.

PART 3 - EXECUTION

3.01 PROVIDE CONDUIT AS FOLLOWS:

A. GENERAL

The Drawings are diagrammatic, and are intended to show the general location of outlets, devices, fixtures, and arrangement and control of circuits. The Contractor shall determine exact locations by actual measurement of the building or by reference to the Architectural Drawings.

B. EMT in sizes up to 4 inches when concealed or not exposed to damage and located indoors only. (EMT is not acceptable in wet and damp location.)

C. MINIMUM SIZE: 3/4 inch. All homeruns shall be 3/4" minimum. ½" conduit may be used for drops down walls to a single receptacle or switch.

D. Flexible metal shall be used for connecting rotating equipment installed in conditioned spaces.

E. Install exposed conduit in mechanical rooms, and elsewhere as indicated, parallel to horizontal and vertical lines of walls, ceilings, and floors.

F. Outlet boxes in partitions shall never be set back to back. They shall be offset to prevent undue noise transmission from room to room.

G. Concealed conduit shall run in as direct manner as possible using long bends. Exposed conduit shall be run parallel with or at right angles to the lines of the building; and all bends shall be made with standard conduit elbows or conduit benders. Not more than equivalent of four quarter bends shall be used in any run between terminals and cabinet, of between outlet or junction boxes. Approved condulets shall be used in lieu of conduit elbows where ease of installation and appearance warrants their use and approved by the engineer. Conduit joints shall be made with approved couplings and unions.

END OF SECTION

SECTION 262816 - SAFETY AND DISCONNECT SWITCHES

PART 1 - GENERAL

1.01 SCOPE

A. Provide safety and disconnect switches as shown, scheduled and as specified herein.

1.02 STANDARDS

A. Products shall be designed, manufactured, tested and installed in compliance with applicable standards.

1. NEMA KS1 - Enclosed switches
2. Federal specification W-S-865C-Heavy duty switches

B. Products shall conform all applicable UL standards, including UL98 (standard for safety, enclosed and dead front switches) and shall be UL-labeled.

1.03 ACCEPTABLE MANUFACTURERS

A. Provide one of the following manufacturers:

1. General Electric Company
2. Square D Company
3. Siemens
4. Eaton

1.04 SUBMITTALS

A. Shop drawings shall include, but not be limited to:

1. Cutsheets of switches with ratings, physical dimensions and all accessories clearly labeled.

1.05 REQUIREMENTS OF REGULATORY AGENCIES

A. WORK IN ACCORDANCE WITH:

1. National Electrical Code.
2. Local, municipal, or state codes that have jurisdiction.

PART 2 - PRODUCTS

2.01 GENERAL

A. Furnish and install heavy duty type safety switches with the number of switched poles as indicated on the plans and specifications. All safety switches shall be NEMA Heavy Duty Type HD, and Underwriters Laboratories listed.

2.02 MATERIALS AND COMPONENTS

A. Ratings

Switches shall be horsepower rated for ac and/or dc as indicated by the plans. The fused switches shall have Class R rejection fuse clips or adjusted for Class J fuses. UL listed short circuit ratings of the switches, when equipped with Class R fuses, shall be 200,000 symmetrical amperes.

B. Enclosures

1. Indoor switches shall be furnished in NEMA 1 enclosures.
2. Outdoor switches, switches located in wet areas or sprinkled areas shall be furnished in NEMA 3R enclosures.
3. Switches installed in wet areas such as cooling tower areas shall be NEMA 4X stainless steel or fiberglass reinforced polyester.
4. Switches installed in kitchens shall be stainless steel.
5. Switches installed in areas of a corrosive nature and subjected to salt air shall be NEMA 4X stainless steel or fiberglass reinforced polyester.

C. Service Entrance

Switch shall be suitable for use as service entrance equipment when installed in accordance with the National Electrical Code.

PART 3 - EXECUTION

3.01 GENERAL

A. Install safety and disconnect switches, including electrical connections, and fuses in accordance with manufacturer's written instructions, NEC and recognized industry practices.

B. Location: Install switches within sight of controllers.

C. Hubs: Provide bolt-on hubs for rainproof or wet area applications.

3.02 IDENTIFICATION

A. Nameplate: Each disconnect switch shall have an engraved bakelite nameplate. Nameplates shall be white with black letters and show equipment served. Nameplates shall be attached with stainless steel screws.

END OF SECTION

SECTION 265100 - LIGHTING FIXTURES

PART 1 - GENERAL

1.01 SCOPE

A. Furnish and install general and emergency lighting fixtures as noted on the drawings. Fixtures shall be completely wired with lamps installed and shall be in perfect operating condition at the time of substantial completion.

B. The types of lighting fixtures required for this project include:

1. LED

1.02 STANDARDS

A. All fixtures shall conform to all applicable UL standards and shall be UL label including damp and wet location ratings. "ETL listed" is an acceptable listing.

B. NFPA 101

C. ANSI C82.1

D. NEMA-LE

E. All LED drivers shall be UL recognized Class 2 per UL1310 or non-Class 2 per UL 1012 as applicable.

F. All LED drivers shall comply with applicable requirements of the Federal Communications Commission (FCC) rules and regulations, Title 47 CFR part 15, for Non-Consumer Equipment.

G. All LED drivers shall be RoHS compliant.

1.03 ACCEPTABLE MANUFACTURERS

A. Provide lighting fixtures produced by manufacturers as shown and scheduled.

1.04 SUBMITTALS

A. Shop drawings shall include a brochure with a separate cut sheet for each fixture type arranged in alphabetical order with fixture and all accessories/options clearly labeled. Provide performance data for each fixture.

1.05 REQUIREMENTS OF REGULATORY AGENCIES

A. WORK IN ACCORDANCE WITH:

1. National Electrical Code.
2. Local, municipal, or state codes that have jurisdiction.
3. UL fire resistance directory.

PART 2 - PRODUCTS

2.01 MATERIALS AND COMPONENTS

A. General:

Provide the size, type and rating of each light fixture shown and scheduled. All light fixtures shall complete with reflectors, lens, trim rings, flanges, lamps, lamp holders, ballast, starters, fuses, wiring, earthquake clips, etc. to provide a complete functioning light fixture.

B. Lighting Fixture Types:

1. LED Fixtures
   a. Fixtures shall be pre-wired with frame-in kit and integral thermal protection required by UL for recessed fixtures. Driver shall be encased in metal-can construction for optimal thermal performance.
2. Exit signs
   a. Exit signs shall meet all federal, state and local codes.
   b. Provide fire alarm interface relay when required to flash exit signs.
   c. Provide battery packs for emergency operation when not connected to emergency generator power.

PART 3 - EXECUTION

3.01 INSTALLATIONS

A. General

1. Install the type of light fixture where shown and indicated in accordance with manufacturer's written instructions.
2. Provide earthquake clips on all recessed lay-in light fixtures as required by building code.
3. Adjust all adjustable light fixtures, as directed by the Architect.

B. Coordination

1. The contractor shall verify the type of fixtures with the ceiling types as indicated on the drawings. Any discrepancies shall immediately be

3.02 FINAL INSPECTION

A. Demonstrate proper operation of all fixtures and controls.

END OF SECTION

SECTION 28310013 - FIRE ALARM & SMOKE DETCTION SYSTEM (SMALL & MEDIUM ANALOG SYSTEM)

PART 1 - GENERAL

1.01 SCOPE

A. The contractor shall design, furnish and install a complete microprocessor based 24VDC, electrically supervised, analog intelligent fire alarm system as specified herein and provide drawings. The system shall include, but not be limited to, all control equipment, power supplies, signal initiating and signaling devices, conduit, wire, fittings, and all other accessories required to provide a complete and operable system.

B. The system shall operate as a non-coded, continuous sounding system, which will sound alarm devices until manually silenced, as herein specified.

C. The system shall be wired as a style B and style 4 supervised system for all circuits.

1.02 CODES AND STANDARDS

A. The system shall comply with the applicable Codes and Standards as follows:

1. National Electrical Code - Article 760.
2. National Fire Protection Association Standards: NFPA 70 NEC

    a. NFPA 72 Protective Signaling Systems (current State adopted version) NFPA 90A Air Conditioning
    b. NFPA 101 Life Safety Code UL 1971 Visual Devices ANSI 117.1 Visual Devices

3. Local & State Building Codes
4. Requirements of Local Authorities having Jurisdiction. If local authorities design requirements differ substantially from contract drawings, the design engineer shall be notified no less than 10 days prior to bid date, to allow time for addendum to be provided to all contractors. Contractor to provide additional devices as required by local authorities in bid pricing.
5. Underwriters Laboratory Requirements and Listings for use in Fire Protective

B. Signaling Systems as follows:

1. UL 864 Control Panels 9th Edition UL 268 Smoke Detectors - Systems UL 268A Duct Smoke Detectors
2. UL 521 Heat Detectors
3. UL 228 Door Holder-Closers
4. UL 464 Audible Signaling Appliances UL 1971 Visual Signaling Appliances UL 38 Manual Alarm Stations

1.03 ACCEPTABLE MANUFACTURERS

A. To establish the type, quality, and features of system required, the equipment specified is that of the Notifier Fire Systems.

B. All equipment, materials, accessories, devices, etc. covered by the specifications and/or noted on the contract drawings shall be new and unused and be U.L. listed for their intended use.

C. All references to manufacturer or supplier's model numbers and other pertinent information herein is intended to establish a minimum standard of quality, performance and features required. All equipment proposed as an EQUAL to that specified shall COMPLETELY conform to the specifications herein.

D. Equipment of other manufacturer's or supplier's may be considered as an equal to that specified provided that completely marked and identified catalog sheets of all proposed equipment is provided to the architect/ engineer for review ten (10) days prior to the date of bid for evaluation. In addition, a list of the contractor's qualifications and any exceptions to the specifications must be provided for review. Approval for any such substitution of equipment must be obtained in writing from the architect/engineer five (5) days prior to bid.

E. Provide one of the following manufacturers:

1. Notifier Fire Systems
2. Siemens
3. Edwards System Technology (EST)

1.04 GENERAL REQUIREMENTS

A. Contractor Qualifications:

1. The equipment supplier shall be an authorized and designated representative of the Fire Alarm Manufacturer to sell, install, and service the proposed manufacturer’s equipment.
2. The equipment supplier and installing contractor shall be licensed by the State

    a. Fire Marshall to sell, install, and service fire alarm systems as required by Article 5.43-2 of the Texas Insurance Code.

3. The installing contractor and/or equipment supplier shall have on his staff a minimum of three (3) installation superintendents who are licensed by the State Fire Marshall’s office for such purpose and under whose supervision installation, final connections, and check out will take place as required by the Texas Insurance Code.
4. The installing contractor or equipment supplier shall have on staff a minimum of one (1) certified NICET Level III state licensed fire alarm planner under whose supervision system design shall take place.
5. The installing contractor shall provide 24 hour, 365 days per year emergency service with qualified and state licensed service technicians.

6. The installing contractor shall have been actively engaged in the business of selling, installing, and servicing fire alarm systems for at least ten (10) years.

1.05 SUBMITTALS

A. The installing contractor and/or equipment manufacturer shall provide complete and detailed shop drawings and include:

1. Control panel configuration including wiring and interconnection schematics.
2. Complete point to point wiring diagram showing terminal connections to all system devices.
3. Riser wiring diagram and associated zoning/addressing configurations with associated conduit sizes.
4. Complete floor plan drawings locating all devices associated with the fire alarm system. Floor plan drawings shall include conduit and wiring routing complete with conduit sizing and number of conductors by type.
5. Factory data sheets on each piece of equipment to be used and so marked as to model, dimensions, size, voltage, and configuration.
6. Detailed system description in this specification format describing system functions and operation. All specification variations and deviations shall be clearly noted and marked.
7. Complete Bill of Material for reference.
8. Programming matrix defining all input/output functions and zoning.
9. Power supply and battery calculations.
10. A letter from the manufacturer stating that the fire alarm system contractor is authorized to sell, service and install the submitted equipment.

B. Submittal shall include documentation confirming all qualifications in 1.04-A have been met. Submittals without qualification documentation shall be rejected.

C. All submittal data will be in bound form with contractor’s name, supplier’s name, project name, and state fire alarm license number adequately identified.

D. Only basic equipment devices have been shown on the contract drawings. Specific wiring between equipment/devices has not been shown. It is the contractor’s responsibility to submit for approval the COMPLETE ENGINEERED system configuration and layout showing all devices, wiring, conduit, and locations along with other required information as specified herein.

1.06 COORDINATION

A. It shall be the responsibility of the installing contractor to coordinate all requirements surrounding installation of the fire alarm system with all trades including, but, not exclusive of: electrical contractor, sprinkler contractor, and HVAC/controls contractor and intercom system. Adequate coordination shall be provided to insure proper installation and interface to all peripheral items required to interact with the fire alarm and communication system to

provide a complete and functional life safety system.

PART 2 - PRODUCTS

2.01 SYSTEM FUNCTIONAL OPERATION

A. Alarm Detection

1. When a fire alarm condition is detected by any of the system alarm initiating devices, the following functions shall occur:

a. The system common alarm LED on the CPU Module shall flash. The internal audible trouble device shall sound. Acknowledgement or silencing the alarm condition shall silence the alarm signals and cause flashing alarm LED's to illuminate steady.
b. An 80 character back-lit LCD display shall indicate all applicable information associated with the alarm condition including: zone, device type, divide location, and time of alarm. Location and zoning messages shall be custom field programmed to respective premises.
c. Any remote or local annunciator LED's associated with the alarm zone shall be illuminated as herein specified.
d. A three-channel digital alarm communicator shall be integrally provided and transmit trouble and alarm signals to an approved remote station (remote station connection and service provided by Owner).
e. All automatic events programmed to the alarm point shall be executed and the associated indicating devices and/or outputs activated.
f. Activate all audible and visual alarm notification devices.
g. De-activate HVAC systems over 2,000 CFM.
h. Display system status changes on the remote annunciators.
i. Release all smoke doors, fire doors, fire coiling doors, fire smoke dampers and fire shutters.

B. System Trouble Detection

1. When a trouble condition is detected by the CPU, one of the system initiating, alarm or SLC circuits, the following functions shall immediately occur:

a. The system trouble LED on the CPU module shall flash and the internal audible trouble device shall sound. Acknowledgement of the trouble condition shall silence the audible trouble device and cause all trouble LED's to illuminate steady.
b. The 80-character alphanumeric LCD annunciator shall display all applicable information via the alphanumeric display associated with the respective trouble condition and its location.

C. Auxiliary Control

1. All designated "non-silenceable" auxiliary control functions shall

remain in operation (even upon silencing of audible alarms) until such time as the control panel is cleared and reset manually (i.e. fan control outputs, central station interface, elevator recall interface, etc.).

2. Activation of duct smoke detectors associated fans shall shutdown their respective units immediately in addition to identifying the condition as herein specified. Duct detectors shall be programmed as a supervisory condition per NFPA 72.

D. System Supervisory Detection

1. When a supervisory condition is detected by the fire alarm control panel, the following functions shall occur:

a. The fire alarm control panel supervisory indicator shall flash and the internal audible device shall sound. Acknowledgment of the supervisory condition shall silence the audible device and cause the supervisory indicator to illuminate steady.
b. The 80-character liquid crystal display shall display all applicable
c. information associated with the respective supervisory condition.
d. Activate a supervisory contact closure to interface with the owner provided central station monitoring service.
e. Print the status change messages on the system printer.
f. Display the system status change on the remote annunciators.

E. Fire Drill Control

1. Provide a fire drill switch located on the Fire Alarm Control Panel. When activated, this switch will activate all horn/strobes and speakers for a fire drill. It shall not release fire shutter, shut down air handling equipment or recall elevators. If a fire alarm condition is detected, the system shall operate as defined in part 2.01A of this section.

2.02 ZONING

A. The system shall have the inherent capability to employ "Intelligent' smoke detectors and addressable interface devices capable of being recognized and annunciated at the main control panel on an individual basis. All zoning/device location information shall be totally field programmable to exact job requirements as approved by the Architect/Engineer.

2.03 FIRE ALARM CONTROL PANEL

A. The fire alarm control panel shall be Notifier series NFS2-640. The control panel shall utilize DISTRIBUTED solid-state MICROPROCESSORS. The microprocessor based CPU shall be completely FIELD PROGRAMMABLE. CPU module shall provide for programmable non-volatile EEPROM memory. All circuitry shall be U.L. listed for power-limited application. System shall be sized to accommodate the capacity of the system specified and shown on the drawings. System shall be capable of being networked for future expansion.

B. Central Processing Unit Module (CPU)

1. The CPU shall contain and execute all custom time control functions or

control- by-event programs for specified events including 'Holiday' exceptions. Time control event/programs shall be automatically overridden by priority fire alarm events. All programs shall be held in non-volatile programmable EEPROM memory, and shall be lost if both system primary and secondary power failure occurs

2. System CPU shall also provide for non-alarm points for non-fire, low priority building functions. The CPU shall provide capability of multi-stage signaling, tornado warning, positive alarm sequencing as well as remote control system operation.

C. Display

1. The DIA shall provide an 80-character backlit, supertwist Liquid Crystal Display (LCD). It shall provide Light-Emitting Diodes (LED's) for AC POWER; SYSTEM ALARM; SYSTEM TROUBLE; SUPERVISORY; CPU FAIL; and ALARM SILENCED.
2. The display shall provide power to a 21-key membrane keypad with control capability to command all system functions, status readouts, manual control action, and entry of any alphanumeric or numeric information. The keypad shall include means to enter multiple five-digit passwords to prevent unauthorized manual control programming.

D. Control Switches

1. Acknowledge/Step Switch
2. Signal Silence Switch
3. Evacuate
4. Lamp Test/Reset

E. System Outputs

1. The system shall provide the following outputs:

    a. One port for CRT, modem, and/or printer (RS-232c)
    b. One port for supervised remote LCD annunciators (RS-485)
    c. Four notification appliance circuits (NAC) F. Loop Interface (SLC)
    d. The CPU shall communicate and provide power to all devices on its loop over a single pair of wires. The CPU shall receive digital/ANALOG information from all "intelligent" detectors and shall process this information to determine normal, alarm, trouble, and sensitivity conditions. The analog information may be used for automatic test and determination of maintenance requirements, and be U.L. listed for such use. The CPU module shall individually monitor all "intelligent" detectors for sensitivity variation initiating a trouble condition should detector sensitivity "drift" become excessive. The system control unit shall have the capability to remotely read each detector's sensitivity in % obscuration, and if need be, electronically adjust the detector sensitivity as required for existing conditions within U.L. recommended limits. In addition, the system shall incorporate a "day/night" sensitivity feature. The system shall provide capability to program each individual detector for multiple 'pre-alarm' conditions. Each 'pre-alarm' level shall be field

programmable as a function of the programmed alarm level. The system shall allow designated control-by-event actions to occur as may be required prior to any sensor reaching the designated alarm point.

F. Non-Lock Walk Test

1. The system shall include a special non-lock "walk test" mode. The walk test mode shall incorporate a one-hour time-out feature to return system to normal. Test results shall be capable of being generated and displayed on LCD annunciator or printed out on system printer.

G. Automatic Detector Test

1. The system shall include a special automatic detector test feature, which permits reading and adjustment of the sensitivity of all intelligent detectors from the main control panel. In addition, the automatic test feature shall also permit the functional testing of any "intelligent" detector or addressable interface device individually from the main control panel. An automatic detector test shall occur automatically a minimum of every two-hour period or be initiated manually from the FACP as desired. Automatic detector test sequencing shall be terminated upon receipt of a true alarm condition.

H. Special System Reports

1. The system shall have the ability to generate and print, upon command, system and point status reports. Selection of 'system' read status provides the operator with global system programming information as well as providing the operator with all individual point programming data. The system shall also provide the capability to print out a detailed 'history' report from system history file upon command.

I. Field Programming

1. The system shall be 100% field programmable without the need for external computers or, PROM programmers, and shall NOT require replacement of memory IC's. All programs shall be stored in non-volatile EEPROM memory. Programming shall be accomplished only after entering an appropriate and pre-selected five-digit password security code. System programming mode shall NOT require the system to be taken off-line nor prohibit the system from performing its normal operations and routines. The system shall be capable of revising/changing programmed functions or system expansion at any time subsequent to initialization as described herein without factory modifications or factory programming. Field programming via the use of external computers may be considered provided programming can be accomplished on-site and the owner is permanently furnished with the required programming apparatus and software as part of this contract.

J. Event History

1. The main fire alarm panel shall have the resident ability to store a minimum of 600 system events in chronological order of occurrence. Event history shall include all system alarms, troubles, operator actions, unverified alarms, circuit/point alterations, and component failures. Events shall be time and date stamped. Events shall be stored in non-volatile buffer memory. Access to history buffer shall be secured via five-digit password security code. Systems not employing event history memory storage shall be required to furnish a printer/recorder for recording system events.

K. Power Supply

1. The power supply shall provide all control panel and peripheral power needs with filtered power as well as rectified 24VDC power for external audio-visual devices. All power supplies shall be designated to meet UL and NFPA requirements for POWER-LIMITED operation on all external signaling lines, including initiating circuits and indicating circuits.
2. Input power shall be 120VAC 60Hz. The power supply shall provide internal supervised batteries and automatic charger. The power supply shall provide both positive and negative ground fault supervision, battery/charger fail condition, A.C. power fail indicators. The power supply shall also provide supervision of modular expansion power supplies as may be required.

2.04 FIELD DEVICES

A. Multi sensor Detector (Smoke and Heat)

1. Provide Notifier FAPT-851 intelligent multi sensor smoke detectors. The multi sensor analog detector shall use a light scattering type photoelectric smoke sensor, a unipolar ionization smoke sensor and an ambient temperature sensor to sense changes in air samples from its surroundings. The integral microprocessor shall employ time based algorithms to dynamically examine data. The Multi sensor shall be capable of adapting to ambient environmental conditions. The temperature sensor shall self-adjust to the ambient temperature of the surrounding air and input an alarm when there is a change of 65° F in ambient temperature. Systems using central intelligence for alarm decisions shall not be acceptable. The detector shall continually monitor any changes in sensitivity due to the environmental effects of dirt, smoke, temperature, age and humidity. The information shall be stored in the integral processor and transferred to the analog loop controller for retrieval using a laptop PC. Separately mounted photoelectric detectors, ionization detectors and heat detectors in the same location are not acceptable alternatives.
2. The Multi sensor smoke detector shall be rated for ceiling installation at minimum of 30 ft. (9.1m) centers and suitable for wall mount applications. The Multi sensor shall be suitable for direct insertion into air ducts up to 3 ft. (0.91m) high and 3 ft. (0.91m) wide and air velocities up to 500 ft./min. (0-2.54m/sec) without requiring specific duct detector housings or supply tubes. The percent smoke obscuration per foot alarm set point shall be field selectable to any of

five sensitivity settings ranging from 1.0% to 3.5%. The integral heat sensor shall cause an alarm when it senses a change in ambient temperature of 65° F or reaches it fixed temperature alarm set point of 135° F nominal. The Multi sensor detector shall be suitable for operation in the following environment:

a. Temperature: 32° F to 100° F (0° C to 38° C)
b. Humidity 0-93% RH, non-condensing c. Elevation: Up to 6,000 ft. (1828m)

B. Intelligent Duct Detector

1. Notifier model DNR series duct mounted "intelligent" photoelectric smoke detectors shall be provided per applicable codes. Detectors shall operate on the same principles and exhibit the same basic characteristics as area type "intelligent" smoke sensors. The unit shall be capable of interchanging/accepting either photo-electronic or ionization type sensors. The detector shall operate in air velocities of 300 FPM to 4,000 FPM. Each detector shall interface directly to the system SLC loop without the use of zone modules.
2. The unit shall consist of a clear noryl molded plastic enclosure with integral conduit knockouts. The unit shall be provided with clear faceplate cover to provide visual viewing of detector/sensor for monitoring sensor operation and chamber condition. The duct housing shall be provided with gasket seals to insure proper seating of the housing to the associated ductwork. Each unit's sampling tubes shall extend the width of the duct and be provided with porosity filters to reduce sensor/chamber contamination. Detectors shall be installed per NFPA 90A, and be listed with the fire alarm control panel. A remote LED shall be located on the corridor ceiling adjacent to the respective detector where detectors are not plainly viible or concealed from view.

C. Intelligent Thermal Detectors

1. Notifier Model FST-851R analog, fixed temperature and rate of rise thermal detectors shall be provided where indicated on the drawings. The detectors shall use dual electronic thermostats to measure temperature levels in the chamber and shall, on command from the control panel, send data to the panel representing the analog temperature level.
2. The detectors shall provide address-setting means on the detector heat using rotary decimal switches. No binary coding shall be required. Systems requiring separate detector programming apparatus will be unacceptable.
3. The detectors shall provide dual alarm and power/status LED's. Status LED's shall flash under normal conditions, indicating that the detector is operational and in regular communication with the control panel. Both LED's may be placed into steady illumination by the control panel, indicating that an alarm condition has been detected. An output connection shall also be provided in the base to connect an external remote alarm LED.
4. The detector shall be semi-flush ceiling mounted and be provided with modular detector head with twist-lock base.

5. Provide weatherproof heat detectors in the Garage Areas or other non-airconditioned areas where detection is required.

D. Addressable Manual Pull Stations

1. Notifier Model NBG-12LX manual stations shall be provided where indicated on the drawings. The manual station shall provide address-setting means using rotary decimal switches. No binary coding shall be required.
2. Manual stations shall be designed for semi-flush mounting on standard electrical box. The station shall be constructed of hi-impact red molded Lexan with instructions for station operation in raised white letters. Stations shall be of the dual action type.
3. All manual pull stations shall be provided with an STI-1100 series clear plastic cover with integral horn.

E. Monitor Module

1. Notifier model FMM-101 addressable monitor modules shall be provided where required to interface to contact alarm devices. The monitor module shall be used to connect a supervised zone of conventional initiating devices to an intelligent SLC loop.
2. The monitor module shall provide address-setting means using rotary decimal switches. No binary coding shall be required.

F. Control Module

1. Notifier model FCM-1 or FRM-1 control and relay modules shall be provided where required to provide audible alarm interface and/or relay control interface. The control module shall be used to connect a supervised zone of conventional indicating devices to an intelligent loop. The zone may be wired class A or class B - field selected. The control module may be optionally wired as dry contact (form C) relay.
2. The control module shall provide address-setting means using rotary decimal switches. No binary coding shall be required. A status LED shall be provided which shall flash under normal conditions, indicating that the control module is operational and in regular communication with the control panel. The LED shall illuminate steady when the device is actuated via the fire alarm control panel.

G. Electronic Audio Visual Devices

1. Audible/Visual alarm devices shall be Notifier "P" Series SpectrAlert Advance electronic horn/strobe units, to be located where indicated on the drawings. Devices shall be wall or ceiling mounted as indicated on the drawings. AV devices shall be provided with the ability to provide multiple candela settings. Units shall operate at 24VDC and be polarized supervised. Each unit shall provide a choice of three difference audible tones capable of being field selected. Preferred alarm signal shall be a temporal tone producing a sound pressure level of 84 dBA. The visual device shall use Xenon strobe type producing a minimum of 15 candela on a 24 VDC limited energy supervised circuit and meet the requirements of ADA and TAS. Strobe unit shall

automatically flash upon operation of the horn. Horn/strobe unit shall be provided in textured white finish and be flush mounted. All visual devices shall be synchronized.

H. Electronic Alarm Horn

1. Provide Notifier H Series solid state electronic alarm device where indicated on the contract drawings. Units shall operate at 24 VDC and be polarized supervised. Each unit shall provide a choice of three different audible tones capable of being field selected. Preferred alarm signal shall be a temporal tone producing a sound pressure level of 84 dBA. Units shall be flush mounted and molded of high-impact white plastic.

I. Exterior Audio-Visual Devices

1. All audiovisual devices located outside or labeled weatherproof shall be weatherproof. Provide the following devices:

   a. SpectrAlert Advance "PK" Series for audio/visual devices.
   b. SpectrAlert Advance for "SK" Series for visual devices
   c. All devices shall be provided with a weather proof type back box.

J. High Intensity Visual Signals

1. Provide a Notifier "S" Series SpectrAlert Advance visual signal device. High intensity visual signals shall be installed where shown on the drawings and as may be required by the Americans with Disabilities Act (Public Law 101-336) and TAS.
2. High intensity visual alarms shall be Xenon strobe type producing a minimum of 15 candela on a 24 VDC limited energy supervised circuit. Alarm devices shall be designated to be wall or ceiling mounted as indicated on the drawings. Signals shall operate in unison with audible alarm appliances. All visual devices shall be synchronized. Units shall be flush mounted and shall be provided in textured white.

K. Auxiliary AHU Relays

1. Notifier/Air Products model MR-101/C relays or approved equal shall be provided for HVAC and AHU control and interface. Relays shall be heavy duty type and rated up to 10 amps at 24 VDC, 60 HZ. Relays shall be provided with NEMA I dust cover assembly and be provided with SPDT contacts as well as (fail safe) so that if the cable is broken, disconnected etc., the AHU will automatically shut down.

L. Field Charging Power Supplies

1. Provide Notifier FCPS-24 power supplies with battery backup as required. Provide 120 volts dedicated circuit to each power supply.

M. Remote LCD Alpha-Numeric Annunciators

1. Provide where indicated on the drawings, a Notifier FDU-80 remote

LCD alpha-numeric annunciator to annunciate all system events and duplicate the displayed status at the main FACP. The annunciator shall be a backlit eighty-character LCD display and operate via the system RS485 and RS232 serial output terminal from main FACP. The LCD display shall automatically illuminate upon receipt of an alarm or trouble condition. The luminary source shall extinguish during normal/standby model to conserve power. The unit shall operate from FACP 24VDC power and function during system power failure while the system resides on standby batteries. The remote LCD annunciator shall include:

- Integral time-date clock
- Time-date select clock
- Time-date/contrast adjust
- Display/step switch
- System reset
- System silence
- System acknowledge
- Integral trouble buzzer

2. Annunciator shall upon command display the first system alarm, last alarm, and system alarm count. The unit shall be equipped with an integral lamp test feature. The unit shall be semi flush mounted where shown.

N. Protective Covers

1. Provide protective covers on all wall mounted fire alarm devices located in student restrooms, corridors and in the cafeteria. These protective covers shall be manufactured by Safety Technology International, Inc. (STI). These covers shall be provided on all devices including but not limited to smoke detectors, heat detectors, audible and visual devices, pull stations, etc. The mounting of a device shall be reinforced to enable the protective covers to protect the fire alarm devices.

PART 3 - EXECUTION

3.01 DESIGN CRITERIA

A. The contractor shall provide drawings for Owner, Engineer and Fire Marshall's approval.

B. Drawings shall be prepared by a state licensed alarm planning superintendent.

C. Drawings shall comply with all local, state and federal code. These include but not limited to N.E.C., U.L., NFPA 101, Etc.

D. Locate the fire alarm control panel in the day room unless otherwise directed by Owner.

E. Locate a remote annunciator in the lobby unless otherwise directed by Owner.

F. Additional items required above minimum codes include the following:

1. Pull Stations – All exits including exit stair wells on multi story

buildings and at the FACP.

2. Smoke Detectors – Paths of egress, electrical rooms, mechanical rooms, MDF, IDF, storage rooms, top of stairs, elevator machine room, top of elevator shaft, above each fire alarm panel and remote power supplies terminal cabinets.
3. Duct type smoke detectors – all air handling units over 2000 CFM in duct work or return air paths.
4. Heat Detectors – Shops, kitchens, coffee bars, central plants, boiler room and truck bays.
5. Flow switches – Sprinkler riser.
6. Horn - throughout the building.
7. Strobes – throughout the building.
8. Remote Power supplies: Locate in mechanical rooms, electrical rooms, MDF or other areas approved by Owner.
9. Smoke Detectors with low frequency sounder bases in all sleeping rooms.

3.02 INSTALLATION

A. Wiring:

1. All wiring shall be in accordance with NFPA 72 and the National Electrical Code, Local Codes, and article 760 of NFPA Standard 70. All wiring sizes shall conform to recommendations of the equipment manufacturer, and as indicated on the engineered shop drawings.
2. All wire shall be U.L. Listed, limited energy (300 volt) FPLP or MPP wire and shall be run open in return air ceiling plenums. The wire shall be listed to U.L. TEST 910 for such applications and is of the low smoke producing fluorocarbon type and complies with NEC Article 760 if so approved by the local authority having jurisdiction. Provide conduit in all inaccessible locations, inside concealed wall, all mechanical/electrical rooms, or other areas where wiring might be exposed and subject to damage.
3. Support wire clear of knock out panels, access panels, and maintenance spaces for equipment. Wire and cable shall be run using wire management techniques supporting cable as close as possible to within one foot of the floor or roof rafters. Wire supports shall be directly fastened to the structure on a maximum of five-foot centers. Wire routing shall be parallel and perpendicular to building lines. The wire and cable shall be secured with tie wraps or carrier wire. Sagging more than three inches will not be allowed nor will bending of the supporting ring structure.
4. All wiring for SLC signaling circuits shall be of the twisted low capacitance type to guard against outside RF and EMF interference and induced noise.
5. All wiring shall be run in a supervised fashion (i.e. no branch wiring or dog-legged wiring) per NFPA requirements such that any wiring disarrangement will initiate the appropriate trouble signals via the main control panel per NFPA and U.L. requirements.
6. Wiring splices shall be kept to a minimum with required splices to be made in designated terminal boxes or at field device junction boxes. Transposing or color code changes of wiring will not be permitted. End-of-line supervisory devices shall be installed with the last device

on the respective circuit. Said device shall be appropriately marked designating it as the terminating device on the respective circuit.

7. No A.C. wiring or any other wiring shall be run in the same conduit as fire alarm wiring.

B. Conduit/Raceway

1. All wire shall be installed in an approved conduit/raceway system (except where permitted by NEC and the local authority having jurisdiction). Maximum conduit "fill" shall not exceed 40% per NEC.
2. Conduit and raceway system shall be installed as specified under the general electrical section of the specifications, and per NEC.
3. Minimum conduit size shall be 3/4" EMT. Install conduit per engineered shop drawings.

C. Minimum Wire Sizes Shall Be as Follows:

1. Signaling Line Circuit: 18 AWG
2. Notification Appliance Circuit: 14 AWG
3. Relay Control Circuits: 18 AWG

D. Sprinkler Valves

1. Contractor shall connect all tamper switches and post indicator valves to the supervisory circuit. Connect all water flow switches to the alarm circuit. Coordinate exact locations of water vaults valves and flow switches with sprinkler contractor.

3.03 NOTIFICATION APPLIANCE CIRCUITS SYNCHRONIZATION

A. All visual and audible devices shall be synchronized per the current state adopted version of NFPA 72. Provide all components required.

3.04 TEST AND REPORTS

A. A state licensed factory trained technical representative of the manufacturer shall perform the final control panel connections and supervise testing of the system and it shall be subject to the approval of the responsible engineer and owner. Upon completion of the acceptance tests, the owner and/or his representatives shall be instructed in the proper operation of the system.

B. The installing contractor shall functionally test each and every device in the entire system for proper operation and response. In addition, each circuit in the system shall be fully tested for wiring supervision to insure proper wiring installation. Any items found not properly installed or non-functioning shall be replaced or repaired and re-tested. All testing shall be supervised by a licensed fire alarm superintendent.

C. The installing contractor shall provide a complete written report on the functional test of the entire system. The test and report shall verify the function of each device in the system, operation of all auxiliary control functions, and the proper operation of the main fire alarm control panel. A copy of the test report shall be provided with maintenance manuals. The

test report shall be signed and dated by the licensed fire alarm superintendent responsible for supervising the final system test and checkout.

D. The installing contractor's fire alarm superintendent shall test the entire system in the presence of the local authorities having jurisdiction.

3.05 SPARE DEVICES

A. Provide 5% spare field devices including labor to install them. Devices not used shall be given to the Owner at completion of the job.

3.06 WARRANTY

A. The fire alarm system shall be free from defects in workmanship and materials, under normal use and service, for a period of one year from the date of acceptance or beneficial occupancy, whichever shall occur first. Any equipment shown to be defective shall be repaired, replaced or adjusted during normal working hours at no cost to the owner.

3.07 GRAPHIC FLOOR PLANS

A. Provide 1/16” = 1’-0” floor plan showing all devices and zoning. Zoning shall correspond to the zone on the fire alarm control panel. The floor plans shall be framed with a glass cover and located by the fire alarm control panel. This graphic floor plan shall use the actual room numbers based on the architectural graphics package. Verify specific requirements with Owner. Provide a sample for approval.

END OF SECTION