PROJECT MANUAL

TOWN OF VALDESE
DRAUGHN AQUATIC CENTER STRUCTURE

Project No. 24-858
Date 09.23.24

INCLUDING ADDENDA #1 AND #2

MICHAEL GRAVES

WALTER ROBBS ARCHITECTS, A MICHAEL GRAVES COMPANY
530 N. Trade Street, Suite 301, Winston-Salem, North Carolina 27101
T 336 725 1371, MICHAELGRAVES.COM

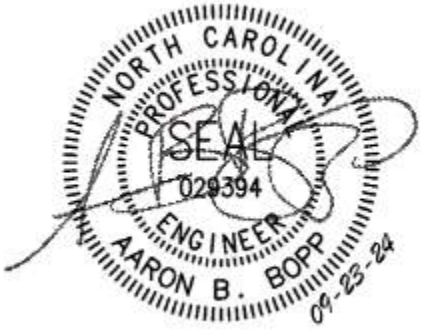
TOWN OF VALDESE
DRAUGHN AQUATIC CENTER STRUCTURE

PROJECT NO. 24-858
09.23.24

Corporate Seal
Walter Robbs Architects,
a Michael Graves Company

Architectural
Walter Robbs Architects,
a Michael Graves Company

Structural
SKA Consulting Engineers



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END OF TOC

ADVERTISEMENT FOR BIDS

Sealed Bids will be received by **the Town of Valdese at 11:00 a.m., November 14, 2024, at the Town of Valdese Town Hall, in the Community Room, at 102 Massel Ave. SW, Valdese, NC 28690**; at which time the Bids will be opened and read publicly for the construction of the following:

Town of Valdese – Draughn Aquatic Center Structure

Bids will be received from invited General Contractors only and their bids will include general construction, plumbing, HVAC, electrical, plumbing, civil, audio/visual and all work indicated by the Bidding Documents.

Digital copies of the Bidding Documents (including Addenda) will be available to invited General Contractors, from the Architect's Office. **Contact Wendy Long (336.725.1372, wlong@michaelgraves.com) who will be keeping a plan holder list for the project as well.** General Contractors will be required to share the Bidding Documents with their sub-contractors.

The project consists of:

> Modifications to the exterior wall adjacent to the pool, installation of pre-engineered membrane structure over pool and pool deck, installation of mechanical, electrical, and plumbing systems in new structure.

Bidders must be properly licensed Contractors in accordance with applicable North Carolina state law.

Bids must be on the standard form provided by the Architect and must be marked to identify the type of Prime Contract noted.

Bidders shall use complete sets of Bidding Documents in preparing Bids; neither the Owner nor Architect assumes responsibility for errors or misinterpretations resulting from the use of incomplete sets of Bidding Documents.

Pre-bid site visits for interested bidders and vendors should be coordinated with David Andersen, Director, CPO, Town of Valdese Parks and Recreation Department (828) 874-6733, DAndersen@valdesenc.gov.

Requests for information (RFIs) should be emailed to Scott Kasper (skasper@michaelgraves.com) and Wendy Long (wlong@michaelgraves.com). RFIs will be received via email only and must be received by 5:00pm, November 7, 2024. An Addendum with RFI responses will be issued on November 12, 2024.

A Bid Bond will be required with each Bid. The Bond shall be in the sum equal to 5% of the gross Base Bid.

A Payment and Performance Bond will be required each in the sum equal to 100% of the Contract Sum.

No Bidder may withdraw his Bid within 30 days after the opening thereof.

The Owner reserves the right to accept or reject any or all Bids, and to waive informalities.

Owner: _____

INSTRUCTIONS TO BIDDERS

1.0 QUALIFICATIONS OF BIDDERS:

a. Any Bidder that can show evidence that he is a responsible Bidder, that can secure the required bonds and insurance, that has a record of completing work correctly and on time, that has a qualified staff, is properly equipped, and is properly licensed as required below, may submit a Bid.

1. All Bidders must be properly licensed Contractors in accordance with state laws governing their respective trade.

2.0 BID EVALUATION:

a. The award of the Contract will be made to the lowest responsible Bidder as soon as practical. The Owner may award based on the Base Bid and any alternates the Owner chooses.

b. Before awarding a Contract, the Owner may require the apparent three (3) low Bidders to qualify themselves to be responsible Bidders by furnishing any or all the following data:

1. The latest financial statement showing assets and liabilities of the company or other information satisfactory to the Owner.

2. A listing of completed projects of similar size and complexity.

3. Permanent name and address of place of business.

4. The number of regular employees of the organization and length of time the organization has been in business under present name.

5. The name and home office address of the Surety proposed and the name and address of the responsible local claim agent.

6. The names of members of the firms who hold appropriate trade licenses, together with license numbers.

7. A list of references.

8. A detailed inventory of personnel and equipment proposed to be used on the Project.

9. A detailed resume of the resident superintendent responsible for the Project.

10. Banking, insurance and bond company references.

11. A list of any pending claims filed against the bidder.

12. A list of all current projects under contract.

13. Other information requested by the Owner or representative and necessary to determine that the Bidder is a responsible Bidder.

c. Failure or refusal to furnish any of the above information, if requested, shall constitute a basis for disqualification of any Bidder.

d. In determining the lowest responsible Bidder, the Owner will take into consideration the past performance of the Bidder with concern given to completion times, quality of work, cooperation with other contractors, and cooperation with the Designer and Owner.

e. Should the Owner adjudge that the apparent low Bidder is not the lowest responsible Bidder by the above information, said apparent low Bidder will be so notified and the bid security shall be returned.

3.0 SITE VISITATION AND EXISTING BUILDING:

a. Before submitting a Bid for this work, each Bidder shall examine the premises and understand the effect existing conditions may have on work under the Contract. No allowances will be made subsequently, in this connection, for any error or negligence on Bidder's part. Because there are no existing conditions drawings, **pre-bid site visits for interested bidders and vendors are strongly encouraged. Site visits should be coordinated with:**

David Andersen, Director, CPO, Town of Valdese Parks and Recreation Department, (828) 874-6733, DAndersen@valdesenc.gov

The Owner will make available access to the roof and other areas within the scope of the project. It shall be the Contractor's responsibility to conduct all work as required to protect from damage existing construction to remain in place.

4.0 OTHER BIDDERS:

a. It shall be the responsibility of each Bidder to become familiar with the Bidding Documents relevant to the other Bidders so that the relationship between other contractors and Bidder will be clear.

5.0 PREPARATION OF BID:

a. Each Bid shall be prepared on the clean copy of the Bid Form bound in the Project Manual. The sample Bid Form bound with the Project Manual shall not be used. The Bidder shall indicate the correct name, address, and license number in the space provided at the top of the first page of the Bid Form.

b. Each Bidder shall indicate again the correct name on the last page of the Bid Form above the signature. Bids by individuals must be signed by the person bidding. Bids by a construction company with sole owner shall be signed in the name of the company by the owner of the company. Bids by partnership shall show the full name of all partners and shall be signed in the name of the partnership by one of the partners.

c. Bids by corporations shall indicate the legal name of the corporation followed by the name of the State of incorporation; and shall be signed by the president or vice president of the corporation. The signature of a person authorized as agent to bid will be acceptable provided the Bid is accompanied by a proper power-of-attorney. Bids by corporations shall have the corporate seal affixed adjacent to the signature.

d. All signatures shall be in ink, and the name of the person signing shall be typed also or printed below the signature followed by a title showing the relationship to the bidding organization such as: "Owner" in the case of a sole owner; "Partner" in case of a partnership; "President", "Vice President", "Secretary", or "Treasurer", in the case of a corporation; or "Agent" in the case of someone acting as agent or attorney-in-fact. A Bid by a person who affixes to the signature the word "President", "Secretary" or "Agent", etc., without disclosing the name of the organization may be held as an individual Bidder.

6.0 STATEMENT OF BIDDERS QUALIFICATIONS:

a. The statement of Bidder's Qualifications which is included as a part of the Bid Form must be completed and submitted with the Bid Form.

b. Failure to comply with this requirement may result in disqualification of the Bidder.

7.0 BASE BID AND ALTERNATES:

a. The amount of the Base Bid shall be typed or printed in both words and figures, and shall be the total charge for the Project, including all Cash Allowances but not including any Bid Alternates. Under this shall be shown the type of Contract, such as "General" "Plumbing", "HVAC", "Electrical", or "Food Service Equipment".

b. If an alternate called for does not, in the Bidder's judgement, require a change in the Base Bid price, the Bidder shall so indicate by writing the words "No Change" in the space provided on the Bid Form for the amount to be added. Each Bidder shall consider how the various alternates will affect the Alternate Bid Price.

c. A detailed description of each Cash Allowance and Bid Alternate may be found in Section 01200 - Alternates, Allowances and Unit Prices, of these Specifications.

8.0 UNIT PRICES:

a. Bidders shall submit unit prices required by the Bid Form.

9.0 TAXES:

a. Bidders are cautioned that the General Assembly has amended the Sales and Use Tax Law to require that the State of North Carolina and its political subdivisions pay all applicable State sales and use taxes on their purchases of taxable tangible personal property.

b. Pursuant to carrying out the provisions of G.S. 105-164, each Bidder shall be registered with the Sales and Use Tax Division of the North Carolina Department of Revenue.

c. All applicable taxes shall be included in the Base Bid submitted by the Bidder.

d. It shall be the duty of the Contractor to give the Owner the advantage of all exemptions or credits in the matter of Federal taxes to which governmental agencies are entitled.

10.0 TIME OF COMPLETION:

a. The number of consecutive calendar days allowed for completion of the Project is stated in the Supplementary Conditions and on the Bid Form.

11.0 ADDENDA:

a. If any person contemplating submitting a Bid for the proposed Contract is in doubt as to the true meaning of any part of these proposed Contract Documents, he may submit to the Architect a written request for an interpretation thereof in time to be received by the Architect not later than seven (7) days prior to the date established for the opening of Bids. The person submitting the request shall be responsible for its delivery.

b. Any interpretation of such documents will be made only by Addendum duly issued, and a copy of such Addendum will be mailed or delivered to each Prime Bidder receiving a set of documents.

c. The Owner will not be responsible for any other explanations or interpretations of such documents which anyone presumes to make on behalf of the Owner before Bid Opening.

d. It is the responsibility of each Prime Bidder to verify for himself that he has received all Addenda; and that material suppliers and subcontractors are familiar with and include in their price all Addenda issued up to the time for Bid Opening.

e. The Bidder shall state the number and date of each Addenda received in the appropriate space on the Bid Form.

12.0 SUBSTITUTIONS:

a. Where any material or equipment is specified by name, or by identification of one or more specific manufacturers, and there are words such as "or approved equal" following the manufacturer(s) listed, then the Bidder may submit equivalent products for consideration for approval for use on the Project. Product must be equivalent in general appearance, construction, quality, and performance to that specified.

b. Any request for approval shall be submitted in writing only by a Prime Bidder and shall be accompanied by sufficient data for use in consideration by the Architect. Request shall be received by the Architect at least 10 days prior to date set for receipt of Bids.

c. Include a copy of the project specification section with a detailed comparison of the proposed substitution versus the specified product entered thereon. Annotate any differences between the specified product and the proposed product.

d. All manufacturer's and other literature submitted must be reviewed and marked-up by the submitter differentiating between applicable and inapplicable information and annotating any differences between the specified product and the proposed product.

e. Submittal must indicate any changes or modifications needed to other parts of the work that will be necessary to accommodate the proposed substitution.

f. If the material or equipment submitted for consideration is approved by the Architect for use on the Project, the Architect will include approval of such item of material or equipment in an Addendum.

g. No substitutes will be allowed without written approval of the Architect. Verbal conversations are unofficial and do not change the requirements of the bidding documents in any way.

h. No substitution will be considered after Contracts are signed except as permitted by the General and Supplementary General Conditions.

i. In the event that the Contractor proposes and receives approval to use a substitute product upon which the Drawings and Specifications are not based it will be Contractor’s responsibility to provide the required coordination and to take whatever actions necessary to insure that the adjacent construction is properly installed to receive the product; to insure that the product is properly installed including all supplementary and accessory components required for the product to work with the construction shown on the Drawings; to make any modifications necessary in order for the product and contiguous or adjacent construction to fit together and work properly; and to do these at no additional cost to the Owner.

j. By making a request for substitution, the Contractor:

1. Represents that the Contractor has personally investigated the proposed substitute product and determined that it is equal or superior in all respects to that specified.

2. Represents that the Contractor will provide the same warranty for the substitution as for the product specified.

3. Certifies that the cost data presented is complete and includes all related costs under this contract except the Architect's redesign costs and waives all claims for additional costs related to the substitution which subsequently become apparent.

4. Certifies that the Contractor will coordinate the installation of the accepted substitute, making such changes as may be required for the work to be complete in all respects.

13.0 BID BOND:

a. No Bid will be considered or accepted unless accompanied by a Bid Guarantee in the form of a deposit equal to 5% of the gross Base Bid. This deposit may be cash; or a cashier's check issued by, or a certified check drawn on a Bank or Trust Company authorized to do business in North Carolina or on a Bank insured by the Federal Deposit Insurance Corp.; or a U. S. Money Order, each payable to the Owner. The deposit will be retained by the Owner if the Bidder fails to execute the Contract within 10 days after notice of the award is given, or if the Bidder fails to give satisfactory surety as required and called for in the Conditions of the Contract.

b. In lieu of making the cash deposit as above provided, any Bidder may submit with the Bid a Bid Bond in the sum of 5% of the gross Base Bid executed by a corporate surety licensed under the laws of North Carolina to execute such bonds, conditioned that the surety will (upon demand) forthwith make payment to the obligee upon said bond if the Bidder fails to execute the Contract within 10 days after notice of the award is given or to give satisfactory surety as required and called for in the Conditions of the Contract.

c. Bid Guarantees will be returned to those Bidders who request it in writing. Bid Guarantees for the 3 lowest Bidders will be held until after Contracts have been signed; all others will be available 3 days or more after time set for receipt of Bids.

14.0 PERFORMANCE AND PAYMENT BONDS:

a. These bonds will be required as specified in the General and Supplementary General Conditions. Sample forms are included in the "Sample Contract Forms" part of the Project Manual.

15.0 SUBMISSION OF BIDS:

a. Each Bid shall be submitted in a sealed envelope indicating the Bidder's name, and shall be marked in the lower left-hand corner as follows:

Bid for "**Town of Valdese – Draughn Aquatic Center Structure**."
Type of Work " _____Contract."
Bidder's Name "_____."
License No. "_____."

b. Bids shall not be mailed in prior to Bid Opening.

c. Sealed Bids shall be brought to the place of bidding by the Bidder and shall be handed directly to the Owner or the Architect prior to the opening time. Place of receipt of Bids and Bid Opening date are stated in the Advertisement for Bids.

d. One representative from each company bidding is required to be present.

e. Bids received after the time set for opening of Bids will not be considered.

16.0 WITHDRAWAL OF BID:

a. Negligence or error on the part of the Bidder in preparing the Bid confers no right for withdrawal of the Bid after it has been opened. No Bid may be withdrawn for 30 days after opening time.

17.0 REJECTION OF BIDS:

a. Bids may be rejected if they show any unexplained erasures, omissions, alterations of form, additions not called for, added restricting or qualifying conditions or other irregularities of any kind.

b. The Owner reserves the right to reject any and all Bids and/or to waive any and all technical defects in the execution of, and informalities in the submission of any Bid, if he considers it to be in the best interest of the Owner.

18.0 AWARDING OF CONTRACT:

a. In accordance with North Carolina General Statutes 143-129, the award will be made to the lowest responsible Bidder, taking into consideration quality, performance, and time specified in the proposal for the performance of the Contract. The Owner will determine to whom the Contract is to be awarded in the case of a tie low bid.

b. The successful Bidder shall sign a Contract with the Owner like the sample copy bound within this Project Manual.

c. See Paragraph "Bid Evaluation" in these Instructions to Bidders for other information and requirements.

19.0 POST-BID INFORMATION:

a. Submissions:

1. Unless waived by the Architect, the Bidder shall, within 7 days of notification of selection for the award of a Contract for the work, submit the following information to the Architect:

(a) A designation of the work to be performed by the Bidder with own forces.

(b) The proprietary names and the suppliers of principal items or systems of materials and equipment proposed for the work.

(c) A list of names of the subcontractors or other persons or organizations (including those who are to furnish materials or equipment fabricated to a special design) proposed for the principal portions of the work.

(d) The list of subcontractors shall be submitted on AIA Document G805 - List of Subcontractors, copy of which is included under the Contract Forms part of this Project Manual. All information required by the document shall be included.

(e) The Bidder will be required to establish to the satisfaction of the Architect and the Owner the reliability and responsibility of the proposed subcontractors to furnish and perform the work described in the Sections of the Specifications pertaining to such proposed subcontractors' respective trades.

(f) Prior to the award of the Contract, the Architect will notify the Bidder in writing if either the Owner or the Architect, after due investigation, has reasonable and substantial objection to any person or organization on such list. If the Owner or Architect has a reasonable and substantial objection to any person or organization on such list and refuses in writing to accept such person or organization, the Bidder may, choose to (1) withdraw the Bid, or (2) submit an acceptable substitute subcontractor with an increase in the Bid price (if applicable) to cover the difference in cost occasioned by such substitution. The Owner may, accept the increased Bid price or may disqualify the Bidder. In the event of either withdrawal or disqualification under this subparagraph, Bid Security will not be forfeited.

(g) Subcontractors and other persons and organizations proposed by the Bidder and accepted by the Owner and the Architect must be used on the work for which they were proposed and accepted and shall not be changed except with the written approval of the Owner and the Architect.

(h) Plumbing, HVAC and electrical subcontractors and all other subcontractors required by law shall have current and proper contractor's license for the scope of their work on this Project.

20.0 MAJOR SUBCONTRACTORS:

a. Each Bidder shall state on the blank spaces provided on the Bid Form, the names of the plumbing, HVAC and electrical subcontractors that he will use if awarded the Contract.

21.0 PREBID CONFERENCE:

a. Approximately 2 weeks prior to the receipt of Bids, the Owner will schedule a prebid conference for clarifying any questions which the Bidders and/or their subcontractors may have. The exact time and place will be included in the first addendum.

b. The Architect and Consultants will be present at this meeting, along with the Owner's representative.

c. An Addendum will be issued, if required, to clarify any items brought out relative to the Contract Documents.

END OF IB

STATE OF NORTH CAROLINA
COUNTY SALES AND USE TAX REPORT
SUMMARY TOTALS AND CERTIFICATION

CONTRACTOR: _____ Page _____ of _____

PROJECT: _____ FOR PERIOD: _____

	TOTAL FOR COUNTY OF:	TOTAL FOR COUNTY OF:	TOTAL FOR COUNTY OF:	TOTAL FOR COUNTY OF:	TOTAL FOR COUNTY OF:	TOTAL FOR COUNTY OF:	TOTAL ALL COUNTIES
CONTRACTOR							
SUBCONTRACTOR(S)*							
COUNTY TOTAL							

* Attach subcontractor(s) report(s)
** Must balance with Detail Sheet(s)

I certify that the above figures do not include any tax paid on supplies, tools and equipment which were used to perform this contract and only includes those building materials, supplies, fixtures and equipment which actually became a part of or annexed to the building or structure. I certify that, to the best of my knowledge, the information provided here is true, correct, and complete.

Sworn to and subscribed before me,

This the _____ day of _____, 20____

_____
Signed

_____
Notary Public

_____
Print or Type Name of Above

My Commission Expires: _____

Seal

NOTE:
This certified statement may be subject to audit

STATE OF NORTH CAROLINA
SALES AND USE TAX REPORT DETAIL

CONTRACTOR: _____ Page _____ of _____

SUBCONTRACTOR _____ FOR PERIOD: _____

PROJECT: _____

PURCHASE DATE	VENDOR NAME	INVOICE NUMBER	TYPE OF PROPERTY	INVOICE TOTAL	COUNTY TAX PAID	COUNTY OF SALE *
				$	$	
				TOTAL:	$	

* If this is an out-of-state vendor, the County of Sale should be the county to which the merchandise was shipped.

BID FORM

Name of Bidder _____

Business Address _____

_____

N.C. License No. _____

Telephone Number _____

Email Address _____

PROJECT: **Town of Valdese – Draughn Aquatic Center Structure**

TO: _____

Gentlemen:

The undersigned, having carefully examined the Bidding Documents, Drawings and Specifications, and all subsequent Addenda as prepared by **Walter Robbs Architects, a Michael Graves Company**, has visited the site and being familiar with all conditions and requirements of the work, hereby agrees to furnish all labor, materials, equipment, services, and other requirements to complete the following construction:

All to be in accordance with the bidding documents for the following amounts:

BASE BID: _____ Dollars ($ _____)

Base Bid does not include state or local sales tax; see Paragraph "Taxes" of Instructions To Bidders. Base Bid does include all Cash Allowances and Quantity Allowances described in Section 01200. Base Bid does NOT include Bid Alternates described in Section 01200.

BID ALTERNATES:

The undersigned agrees to perform all alternate work as described in Section 01200 of the Specifications for the following sums. He further agrees to perform said work without change to the required time of completion of the Project.

Enter price for Bid Alternates involving work included under the Contract bid upon on Page 1 of this Bid Form.

Alternate #1: _____ Dollars ($ _____)

Alternate #2: _____ Dollars ($ _____)

Alternate #3: _____ Dollars ($ _____)

Alternate #4: _____ Dollars ($ _____)

UNIT PRICES:

Should the undersigned be required to perform work over and above that required by the Contract Documents, or should he be ordered to omit work required by the Contract Documents, he will be paid an extra or shall credit the Owner, as the case may be, on the basis of unit prices stated herein, prices quoted being sum total compensation payable or creditable for such items installed and in place, including overhead and profit, general conditions and duration related expenses and all other expenses associated with the work.

Work	Unit	Price
Excavation and off-site removal of unsuitable soil and replacement of off-site backfill (57 stone) compacted.	Cu. Yd.	$ _____

LINE ITEM:

Work	Price
Cost of Field Verification during Mandatory Site Visit (included in Base Bid).	$_____

Addenda have been received as follows:

Addendum No. ____	Date
Addendum No. ____	Date
Addendum No. ____	Date

The undersigned further agrees to sign a Contract for all work in the above amounts, if offered within thirty (30) days after receipt of Bids, and to furnish surety as specified, and upon failure to do so, agrees to forfeit to the Owner, attached cashier's check, certified check or Bid Bond in the amount of:

$_____ of Base Bid).

The undersigned further agrees to begin work promptly after a Notice to Proceed with an adequate force, carry the work forward as rapidly as possible and complete the entire Project no later than _____ consecutive calendar days after the date to begin as specified in the Notice to Proceed.

The undersigned hereby states that he will use the following major subcontractors if awarded the Contract:

Plumbing: _____

HVAC: _____

Electrical: _____

The undersigned agrees that he has executed and submitted with his bid the Statement of Bidder's Qualification which is attached as the last page of this Bid Form.

It is distinctly understood that the Owner reserves the right to reject any and all Bids and to waive informalities and technicalities if considered to be in the best interest of the Owner.

Bidder hereby verifies that he is properly licensed in accordance with North Carolina state laws governing his respective trade and has entered his NC license number on the first page of this Bid Form.

_____
Name of Bidder

By _____
Signature

Title _____

Date Proposal Executed: _____, 202___ .

Note: Execute and include "Statement of Bidder's Qualifications" as the last page of this Bid Form.

STATEMENT OF BIDDER'S QUALIFICATIONS

1. When was firm organized? _____

2. When and where was firm incorporated? _____

3. How many years has firm been engaged in contracting business under its present firm name?
_____

4. Undersigned ( ) is willing ( ) is not willing to furnish a recent Financial Statement if requested to do so by Owner. (Note failure to provide financial information could result in disqualification.)

5. Three projects completed within last five (5) years approximating this project in size and scope.

	Owner	Type Building:	Approx. Cost:	Architect
A.	_____	_____	_____	_____
B.	_____	_____	_____	_____
C.	_____	_____	_____	_____

6. Have you ever refused a contract at your original bid? _____

7. Have you ever defaulted on a contract? _____

If answer to either 6 or 7 above is yes, explain circumstances on attached sheet.

(This statement must be subscribed and sworn to before a Notary Public.)

Sworn to and subscribed
before me this ____ day
of _____, 202___

Firm Name: _____

By: _____

Title: _____

_____
Notary Public

AIA® Document A310™ – 2010

Bid Bond

CONTRACTOR:
(Name, legal status and address)

SURETY:
(Name, legal status and principal place of business)

OWNER:
(Name, legal status and address)

BOND AMOUNT:

PROJECT:
(Name, location or address, and Project number, if any)

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

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

The Contractor and Surety are bound to the Owner in the amount set forth above, for the payment of which the Contractor and Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, as provided herein. The conditions of this Bond are such that if the Owner accepts the bid of the Contractor within the time specified in the bid documents, or within such time period as may be agreed to by the Owner and Contractor, and the Contractor either (1) enters into a contract with the Owner in accordance with the terms of such bid, and gives such bond or bonds as may be specified in the bidding or Contract Documents, with a surety admitted in the jurisdiction of the Project and otherwise acceptable to the Owner, for the faithful performance of such Contract and for the prompt payment of labor and material furnished in the prosecution thereof; or (2) pays to the Owner the difference, not to exceed the amount of this Bond, between the amount specified in said bid and such larger amount for which the Owner may in good faith contract with another party to perform the work covered by said bid, then this obligation shall be null and void, otherwise to remain in full force and effect. The Surety hereby waives any notice of an agreement between the Owner and Contractor to extend the time in which the Owner may accept the bid. Waiver of notice by the Surety shall not apply to any extension exceeding sixty (60) days in the aggregate beyond the time for acceptance of bids specified in the bid documents, and the Owner and Contractor shall obtain the Surety's consent for an extension beyond sixty (60) days.

If this Bond is issued in connection with a subcontractor's bid to a Contractor, the term Contractor in this Bond shall be deemed to be Subcontractor and the term Owner shall be deemed to be Contractor.

When this Bond has been furnished to comply with a statutory or other legal requirement in the location of the Project, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted herefrom and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. When so furnished, the intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

Signed and sealed this day of

(Witness)	*(Contractor as Principal)* *(Seal)*
	(Title)
(Witness)	*(Surety)* *(Seal)*
	(Title)

CAUTION: You should sign an original AIA Contract Document, on which this text appears in RED. An original assures that changes will not be obscured.

FORM OF PERFORMANCE BOND

Date of Contract: _____

Date of Execution: _____

Name of Principal: _____
(Contractor)

_____

Name of Surety: _____

_____

Name of Contracting Body: _____

_____

Amount of Bond: _____

_____

Project: **Town of Valdese – Draughn Aquatic Center Structure**

KNOW ALL MEN BY THESE PRESENTS, that we, the PRINCIPAL and SURETY above named, are held and firmly bound unto the above named Contracting Body, hereinafter called the Contracting Body, in the penal sum of the amount stated above for the payment of which sum well and truly to be made, we bind, ourselves, our heirs, executors, administrators, and successors, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH, that whereas the principal entered into a certain contract with the Contracting Body, identified as shown above and hereto attached:

NOW THEREFORE, if the principal shall well and truly perform and fulfill all the undertakings, covenants, terms, conditions, and agreements of said contract during the original term of said contract and any extensions thereof that may be granted by the Contracting Body, with or without notice to the Surety, and during the life of any guaranty required under the contract, and shall also well and truly perform and fulfill all the undertakings, covenants, terms, conditions, and agreements of any and all duly authorized modifications of said contract that may hereafter be made, notice of which modifications to the surety being hereby waived, then, this obligation to be void; otherwise to remain in full force and virtue.

IN WITNESS WHEREOF, the above-bounden parties have executed this instrument under their several seals on the date indicated above, the name and corporate seal of each corporate party being hereto affixed and these presents duly signed by its undersigned representative, pursuant to authority of its governing body.

Executed in _____ counterparts.

Witness:

_____
Contractor: (Trade or Corporate Name)

_____ By: _____
(Proprietorship or Partnership)

Attest: (Corporation) Title: _____
(Owner, Partner, or Corp. Pres. or Vice Pres. only)

By: _____

Title: _____
(Corp. Sec. or Ass't. Sec. only)

(Corporate Seal)

_____
(Surety Company)

Witness: By: _____

_____ Title: _____
(Attorney in Fact)

Countersigned:

_____ (Surety Corporate Seal)
(N. C. Licensed Resident Agent)

_____

_____
Name and Address - Surety Agency

_____

_____
Surety Company Name and N. C. Regional or Branch Office Address

FORM OF PAYMENT BOND

Date of Contract: _____

Date of Execution: _____

Name of Principal: _____
(Contractor)

_____

Name of Surety: _____

Name of Contracting Body: _____

_____

Amount of Bond: _____

Project: **Town of Valdese – Draughn Aquatic Center Structure**

KNOW ALL MEN BY THESE PRESENTS, that we, the PRINCIPAL and SURETY above named, are held and firmly bound unto the above named contracting body, hereinafter called the contracting body, in the penal sum of the amount stated above for the payment of which sum well and truly to be made, we bind, ourselves, our heirs, executors, administrators, and successors, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH, that whereas the principal entered into a certain contract with the contracting body, identified as shown above and hereto attached:

NOW THEREFORE, if the principal shall promptly make payment to all persons supplying labor/material in the prosecution of the work provided for in said contract, and any and all duly authorized modifications of said contract that may hereafter be made, notice of which modifications to the surety being hereby waived, then this obligation to be void; otherwise to remain in full force and virtue.

IN WITNESS WHEREOF, the above-bounded parties have executed this instrument under their several seals on the date indicated above, the name and corporate seal of each corporate party being hereto affixed and these presents duly signed by its undersigned representatives, pursuant to authority of its governing body.

Executed in _____ counterparts.

Witness:

_____
(Proprietorship or Partnership)

Attest: (Corporation)

By: _____

Title: _____
(Corp. Sec. or Ass't. Sec. only)

_____
Contractor: (Trade or Corporate Name)

By: _____

Title: _____
(Owner, Partner, or Corp.
Pres. or Vice Pres. only)

(Corporate Seal)

_____
(Surety Company)

Witness:

_____

By: _____

Title: _____
(Attorney in Fact)

Countersigned:

_____

_____
(N. C. Licensed Resident Agent)

(Surety Corporate Seal)

_____

_____
Name and Address - Surety Agency

_____

_____
Surety Company Name and N. C.
Regional or Branch Office Address

GENERAL GUARANTEE

_____ guarantees all materials and workmanship incorporated
(Name of Contractor)

in the **Town of Valdese – Draughn Aquatic Center Structure, Massell Ave SW, Valdese, NC 28690**,

against defect due to faulty materials or faulty workmanship or negligence for a period of 12 months from completion of the Project for the General Guarantee and for such longer periods as may be designated by specific Sections of the Project Manual or by manufacturer's warranty on equipment, parts or materials.

This Guarantee is binding where defects occur due to normal usage conditions and does not cover willful or malicious damage, damage caused by acts of God or other casualty.

Sworn to and subscribed before me this _____ day of _____, 202__.

By

Title

_____
(Notary Public)

My Commission expires _____.

ROOFING WARRANTY

Know all men by these presents, that we, _____(Contractor), having installed insulation, roofing, flashing, and sheet metal work, and having accomplished certain other work on **Town of Valdese – Draughn Aquatic Center Structure**, under a Contract between

_____(Owner) and (Contractor), warrant to the Owner with respect to said work that for a period of 2 years from date of final acceptance of said work by the Owner, the roofing system including insulation, roofing membrane, flashings and sheet metal work related to roofing system shall be absolutely watertight and free from all leaks provided, however, that the following are excluded from this warranty:

1. Defects or failures resulting from abuse by the Owner.

2. Defects in design involving failure of (a) structural frame, (b) loadbearing walls, (c) foundations.

3. Damage caused by fire, tornado, hail, hurricane, acts of God, wars, riots, or civil commotion.

We, _____(Contractor), agree that should any leaks occur in the roofing system, we will promptly remedy said leaks in a manner to restore the roofing system to a watertight condition by methods compatible to the system and acceptable under industry standards and general practice.

We, _____(Contractor), further agree that for a period of 2 years from date of final acceptance referred to above we will make repairs, at no expense to the Owner, to any defects which may develop in the work, in a manner compatible to the system and acceptable under industry standards and general practice. Damage to the interior of the building resulting from failure of the roofing system described herein shall be repaired and/or replaced by the Contractor at no expense to the Owner.

IN WITNESS WHEREOF, we have caused this instrument to be duly executed, this _____ day of _, 202___.

_____
(Contractor)

WITNESS: By: _____
President

_____ (Notary Public)

ASBESTOS FREE WARRANTY

Owner: **Town of Valdese**

Location of Building: **Massel Ave SE, Valdese, NC 28690**

Name of Building: **Draughn Aquatic Center Structure**

Date of Substantial Completion: _____

Know all men by these presents that we, _____
(Contractor, Subcontractor, Material Supplier, Equipment Manufacturer)

having furnished labor, materials, equipment and/or supplies; from, to and/or on _____

_____ as shown on the plans and specifications
(Buildings, etc.)

below under contract between _____ and
(Owner)

_____ and
(Contractor, Subcontractor, Material Supplier, Equipment Manufacturer)

dated _____:

warrant to Owner with respect to said work that no materials containing asbestos fibers were incorporated into the work, and that, to our knowledge and belief, no materials containing asbestos remain in or are covered by the work.

Exceptions: _____
(If there are no exceptions, state "No Exceptions" here)

IN WITNESS WHEREOF, we have caused this instrument to be duly executed, this the

_____ day of _____, 20____.

SWORN to and subscribed before me,
On this the ____ day of _____,
20_____.

_____ _____
Company Notary Public

_____ _____
By: My Commission Expires:

_____
Title:

AIA® Document A201™ – 2017

General Conditions of the Contract for Construction

for the following PROJECT:
(Name and location or address)

THE OWNER:
(Name, legal status and address)

THE ARCHITECT:
(Name, legal status and address)

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

For guidance in modifying this document to include supplementary conditions, see AIA Document A503™, Guide for Supplementary Conditions.

TABLE OF ARTICLES

Init.

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(Topics and numbers in bold are Section headings.)

ARTICLE 1 GENERAL PROVISIONS

§ 1.1 Basic Definitions

§ 1.1.1 The Contract Documents

The Contract Documents are enumerated in the Agreement between the Owner and Contractor (hereinafter the Agreement) and consist of the Agreement, Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications, Addenda issued prior to execution of the Contract, other documents listed in the Agreement, and Modifications issued after execution of the Contract. A Modification is (1) a written amendment to the Contract signed by both parties, (2) a Change Order, (3) a Construction Change Directive, or (4) a written order for a minor change in the Work issued by the Architect. Unless specifically enumerated in the Agreement, the Contract Documents do not include the advertisement or invitation to bid, Instructions to Bidders, sample forms, other information furnished by the Owner in anticipation of receiving bids or proposals, the Contractor's bid or proposal, or portions of Addenda relating to bidding or proposal requirements.

§ 1.1.2 The Contract

The Contract Documents form the Contract for Construction. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations, or agreements, either written or oral. The Contract may be amended or modified only by a Modification. The Contract Documents shall not be construed to create a contractual relationship of any kind (1) between the Contractor and the Architect or the Architect's consultants, (2) between the Owner and a Subcontractor or a Sub-subcontractor, (3) between the Owner and the Architect or the Architect's consultants, or (4) between any persons or entities other than the Owner and the Contractor. The Architect shall, however, be entitled to performance and enforcement of obligations under the Contract intended to facilitate performance of the Architect's duties.

§ 1.1.3 The Work

The term "Work" means the construction and services required by the Contract Documents, whether completed or partially completed, and includes all other labor, materials, equipment, and services provided or to be provided by the Contractor to fulfill the Contractor's obligations. The Work may constitute the whole or a part of the Project.

§ 1.1.4 The Project

The Project is the total construction of which the Work performed under the Contract Documents may be the whole or a part and which may include construction by the Owner and by Separate Contractors.

§ 1.1.5 The Drawings

The Drawings are the graphic and pictorial portions of the Contract Documents showing the design, location and dimensions of the Work, generally including plans, elevations, sections, details, schedules, and diagrams.

§ 1.1.6 The Specifications

The Specifications are that portion of the Contract Documents consisting of the written requirements for materials, equipment, systems, standards and workmanship for the Work, and performance of related services.

§ 1.1.7 Instruments of Service

Instruments of Service are representations, in any medium of expression now known or later developed, of the tangible and intangible creative work performed by the Architect and the Architect's consultants under their respective professional services agreements. Instruments of Service may include, without limitation, studies, surveys, models, sketches, drawings, specifications, and other similar materials.

§ 1.1.8 Initial Decision Maker

The Initial Decision Maker is the person identified in the Agreement to render initial decisions on Claims in accordance with Section 15.2. The Initial Decision Maker shall not show partiality to the Owner or Contractor and shall not be liable for results of interpretations or decisions rendered in good faith.

§ 1.2 Correlation and Intent of the Contract Documents

§ 1.2.1 The intent of the Contract Documents is to include all items necessary for the proper execution and completion of the Work by the Contractor. The Contract Documents are complementary, and what is required by one shall be as binding as if required by all; performance by the Contractor shall be required only to the extent consistent with the Contract Documents and reasonably inferable from them as being necessary to produce the indicated results.

§ 1.2.1.1 The invalidity of any provision of the Contract Documents shall not invalidate the Contract or its remaining

provisions. If it is determined that any provision of the Contract Documents violates any law, or is otherwise invalid or unenforceable, then that provision shall be revised to the extent necessary to make that provision legal and enforceable. In such case the Contract Documents shall be construed, to the fullest extent permitted by law, to give effect to the parties' intentions and purposes in executing the Contract.

§ 1.2.2 Organization of the Specifications into divisions, sections and articles, and arrangement of Drawings shall not control the Contractor in dividing the Work among Subcontractors or in establishing the extent of Work to be performed by any trade.

§ 1.2.3 Unless otherwise stated in the Contract Documents, words that have well-known technical or construction industry meanings are used in the Contract Documents in accordance with such recognized meanings.

§ 1.3 Capitalization

Terms capitalized in these General Conditions include those that are (1) specifically defined, (2) the titles of numbered articles, or (3) the titles of other documents published by the American Institute of Architects.

§ 1.4 Interpretation

In the interest of brevity the Contract Documents frequently omit modifying words such as "all" and "any" and articles such as "the" and "an," but the fact that a modifier or an article is absent from one statement and appears in another is not intended to affect the interpretation of either statement.

§ 1.5 Ownership and Use of Drawings, Specifications, and Other Instruments of Service

§ 1.5.1 The Architect and the Architect's consultants shall be deemed the authors and owners of their respective Instruments of Service, including the Drawings and Specifications, and retain all common law, statutory, and other reserved rights in their Instruments of Service, including copyrights. The Contractor, Subcontractors, Sub-subcontractors, and suppliers shall not own or claim a copyright in the Instruments of Service. Submittal or distribution to meet official regulatory requirements or for other purposes in connection with the Project is not to be construed as publication in derogation of the Architect's or Architect's consultants' reserved rights.

§ 1.5.2 The Contractor, Subcontractors, Sub-subcontractors, and suppliers are authorized to use and reproduce the Instruments of Service provided to them, subject to any protocols established pursuant to Sections 1.7 and 1.8, solely and exclusively for execution of the Work. All copies made under this authorization shall bear the copyright notice, if any, shown on the Instruments of Service. The Contractor, Subcontractors, Sub-subcontractors, and suppliers may not use the Instruments of Service on other projects or for additions to the Project outside the scope of the Work without the specific written consent of the Owner, Architect, and the Architect's consultants.

§ 1.6 Notice

§ 1.6.1 Except as otherwise provided in Section 1.6.2, where the Contract Documents require one party to notify or give notice to the other party, such notice shall be provided in writing to the designated representative of the party to whom the notice is addressed and shall be deemed to have been duly served if delivered in person, by mail, by courier, or by electronic transmission if a method for electronic transmission is set forth in the Agreement.

§ 1.6.2 Notice of Claims as provided in Section 15.1.3 shall be provided in writing and shall be deemed to have been duly served only if delivered to the designated representative of the party to whom the notice is addressed by certified or registered mail, or by courier providing proof of delivery.

§ 1.7 Digital Data Use and Transmission

The parties shall agree upon protocols governing the transmission and use of Instruments of Service or any other information or documentation in digital form. The parties will use AIA Document E203™–2013, Building Information Modeling and Digital Data Exhibit, to establish the protocols for the development, use, transmission, and exchange of digital data.

§ 1.8 Building Information Models Use and Reliance

Any use of, or reliance on, all or a portion of a building information model without agreement to protocols governing the use of, and reliance on, the information contained in the model and without having those protocols set forth in AIA Document E203™–2013, Building Information Modeling and Digital Data Exhibit, and the requisite AIA Document G202™–2013, Project Building Information Modeling Protocol Form, shall be at the using or relying party's sole risk and without liability to the other party and its contractors or consultants, the authors of, or contributors to, the building

information model, and each of their agents and employees.

ARTICLE 2 OWNER

§ 2.1 General

§ 2.1.1 The Owner is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Owner shall designate in writing a representative who shall have express authority to bind the Owner with respect to all matters requiring the Owner's approval or authorization. Except as otherwise provided in Section 4.2.1, the Architect does not have such authority. The term "Owner" means the Owner or the Owner's authorized representative.

§ 2.1.2 The Owner shall furnish to the Contractor, within fifteen days after receipt of a written request, information necessary and relevant for the Contractor to evaluate, give notice of, or enforce mechanic's lien rights. Such information shall include a correct statement of the record legal title to the property on which the Project is located, usually referred to as the site, and the Owner's interest therein.

§ 2.2 Evidence of the Owner's Financial Arrangements

§ 2.2.1 Prior to commencement of the Work and upon written request by the Contractor, the Owner shall furnish to the Contractor reasonable evidence that the Owner has made financial arrangements to fulfill the Owner's obligations under the Contract. The Contractor shall have no obligation to commence the Work until the Owner provides such evidence. If commencement of the Work is delayed under this Section 2.2.1, the Contract Time shall be extended appropriately.

§ 2.2.2 Following commencement of the Work and upon written request by the Contractor, the Owner shall furnish to the Contractor reasonable evidence that the Owner has made financial arrangements to fulfill the Owner's obligations under the Contract only if (1) the Owner fails to make payments to the Contractor as the Contract Documents require; (2) the Contractor identifies in writing a reasonable concern regarding the Owner's ability to make payment when due; or (3) a change in the Work materially changes the Contract Sum. If the Owner fails to provide such evidence, as required, within fourteen days of the Contractor's request, the Contractor may immediately stop the Work and, in that event, shall notify the Owner that the Work has stopped. However, if the request is made because a change in the Work materially changes the Contract Sum under (3) above, the Contractor may immediately stop only that portion of the Work affected by the change until reasonable evidence is provided. If the Work is stopped under this Section 2.2.2, the Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable costs of shutdown, delay and start-up, plus interest as provided in the Contract Documents.

§ 2.2.3 After the Owner furnishes evidence of financial arrangements under this Section 2.2, the Owner shall not materially vary such financial arrangements without prior notice to the Contractor.

§ 2.2.4 Where the Owner has designated information furnished under this Section 2.2 as "confidential," the Contractor shall keep the information confidential and shall not disclose it to any other person. However, the Contractor may disclose "confidential" information, after seven (7) days' notice to the Owner, where disclosure is required by law, including a subpoena or other form of compulsory legal process issued by a court or governmental entity, or by court or arbitrator(s) order. The Contractor may also disclose "confidential" information to its employees, consultants, sureties, Subcontractors and their employees, Sub-subcontractors, and others who need to know the content of such information solely and exclusively for the Project and who agree to maintain the confidentiality of such information.

§ 2.3 Information and Services Required of the Owner

§ 2.3.1 Except for permits and fees that are the responsibility of the Contractor under the Contract Documents, including those required under Section 3.7.1, the Owner shall secure and pay for necessary approvals, easements, assessments and charges required for construction, use or occupancy of permanent structures or for permanent changes in existing facilities.

§ 2.3.2 The Owner shall retain an architect lawfully licensed to practice architecture, or an entity lawfully practicing architecture, in the jurisdiction where the Project is located. That person or entity is identified as the Architect in the Agreement and is referred to throughout the Contract Documents as if singular in number.

§ 2.3.3 If the employment of the Architect terminates, the Owner shall employ a successor to whom the Contractor has no reasonable objection and whose status under the Contract Documents shall be that of the Architect.

§ 2.3.4 The Owner shall furnish surveys describing physical characteristics, legal limitations and utility locations for the

site of the Project, and a legal description of the site. The Contractor shall be entitled to rely on the accuracy of information furnished by the Owner but shall exercise proper precautions relating to the safe performance of the Work.

§ 2.3.5 The Owner shall furnish information or services required of the Owner by the Contract Documents with reasonable promptness. The Owner shall also furnish any other information or services under the Owner's control and relevant to the Contractor's performance of the Work with reasonable promptness after receiving the Contractor's written request for such information or services.

§ 2.3.6 Unless otherwise provided in the Contract Documents, the Owner shall furnish to the Contractor one copy of the Contract Documents for purposes of making reproductions pursuant to Section 1.5.2.

§ 2.4 Owner's Right to Stop the Work

If the Contractor fails to correct Work that is not in accordance with the requirements of the Contract Documents as required by Section 12.2 or repeatedly fails to carry out Work in accordance with the Contract Documents, the Owner may issue a written order to the Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, the right of the Owner to stop the Work shall not give rise to a duty on the part of the Owner to exercise this right for the benefit of the Contractor or any other person or entity, except to the extent required by Section 6.1.3.

§ 2.5 Owner's Right to Carry Out the Work

If the Contractor defaults or neglects to carry out the Work in accordance with the Contract Documents and fails within a ten-day period after receipt of notice from the Owner to commence and continue correction of such default or neglect with diligence and promptness, the Owner may, without prejudice to other remedies the Owner may have, correct such default or neglect. Such action by the Owner and amounts charged to the Contractor are both subject to prior approval of the Architect and the Architect may, pursuant to Section 9.5.1, withhold or nullify a Certificate for Payment in whole or in part, to the extent reasonably necessary to reimburse the Owner for the reasonable cost of correcting such deficiencies, including Owner's expenses and compensation for the Architect's additional services made necessary by such default, neglect, or failure. If current and future payments are not sufficient to cover such amounts, the Contractor shall pay the difference to the Owner. If the Contractor disagrees with the actions of the Owner or the Architect, or the amounts claimed as costs to the Owner, the Contractor may file a Claim pursuant to Article 15.

ARTICLE 3 CONTRACTOR

§ 3.1 General

§ 3.1.1 The Contractor is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Contractor shall be lawfully licensed, if required in the jurisdiction where the Project is located. The Contractor shall designate in writing a representative who shall have express authority to bind the Contractor with respect to all matters under this Contract. The term "Contractor" means the Contractor or the Contractor's authorized representative.

§ 3.1.2 The Contractor shall perform the Work in accordance with the Contract Documents.

§ 3.1.3 The Contractor shall not be relieved of its obligations to perform the Work in accordance with the Contract Documents either by activities or duties of the Architect in the Architect's administration of the Contract, or by tests, inspections or approvals required or performed by persons or entities other than the Contractor.

§ 3.2 Review of Contract Documents and Field Conditions by Contractor

§ 3.2.1 Execution of the Contract by the Contractor is a representation that the Contractor has visited the site, become generally familiar with local conditions under which the Work is to be performed, and correlated personal observations with requirements of the Contract Documents.

§ 3.2.2 Because the Contract Documents are complementary, the Contractor shall, before starting each portion of the Work, carefully study and compare the various Contract Documents relative to that portion of the Work, as well as the information furnished by the Owner pursuant to Section 2.3.4, shall take field measurements of any existing conditions related to that portion of the Work, and shall observe any conditions at the site affecting it. These obligations are for the purpose of facilitating coordination and construction by the Contractor and are not for the purpose of discovering errors, omissions, or inconsistencies in the Contract Documents; however, the Contractor shall promptly report to the Architect any errors, inconsistencies or omissions discovered by or made known to the Contractor as a request for information in such form as the Architect may require. It is recognized that the Contractor's review is made in the Contractor's

capacity as a contractor and not as a licensed design professional, unless otherwise specifically provided in the Contract Documents.

§ 3.2.3 The Contractor is not required to ascertain that the Contract Documents are in accordance with applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, but the Contractor shall promptly report to the Architect any nonconformity discovered by or made known to the Contractor as a request for information in such form as the Architect may require.

§ 3.2.4 If the Contractor believes that additional cost or time is involved because of clarifications or instructions the Architect issues in response to the Contractor's notices or requests for information pursuant to Sections 3.2.2 or 3.2.3, the Contractor shall submit Claims as provided in Article 15. If the Contractor fails to perform the obligations of Sections 3.2.2 or 3.2.3, the Contractor shall pay such costs and damages to the Owner, subject to Section 15.1.7, as would have been avoided if the Contractor had performed such obligations. If the Contractor performs those obligations, the Contractor shall not be liable to the Owner or Architect for damages resulting from errors, inconsistencies or omissions in the Contract Documents, for differences between field measurements or conditions and the Contract Documents, or for nonconformities of the Contract Documents to applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities.

§ 3.3 Supervision and Construction Procedures

§ 3.3.1 The Contractor shall supervise and direct the Work, using the Contractor's best skill and attention. The Contractor shall be solely responsible for, and have control over, construction means, methods, techniques, sequences, and procedures, and for coordinating all portions of the Work under the Contract. If the Contract Documents give specific instructions concerning construction means, methods, techniques, sequences, or procedures, the Contractor shall evaluate the jobsite safety thereof and shall be solely responsible for the jobsite safety of such means, methods, techniques, sequences, or procedures. If the Contractor determines that such means, methods, techniques, sequences or procedures may not be safe, the Contractor shall give timely notice to the Owner and Architect, and shall propose alternative means, methods, techniques, sequences, or procedures. The Architect shall evaluate the proposed alternative solely for conformance with the design intent for the completed construction. Unless the Architect objects to the Contractor's proposed alternative, the Contractor shall perform the Work using its alternative means, methods, techniques, sequences, or procedures.

§ 3.3.2 The Contractor shall be responsible to the Owner for acts and omissions of the Contractor's employees, Subcontractors and their agents and employees, and other persons or entities performing portions of the Work for, or on behalf of, the Contractor or any of its Subcontractors.

§ 3.3.3 The Contractor shall be responsible for inspection of portions of Work already performed to determine that such portions are in proper condition to receive subsequent Work.

§ 3.4 Labor and Materials

§ 3.4.1 Unless otherwise provided in the Contract Documents, the Contractor shall provide and pay for labor, materials, equipment, tools, construction equipment and machinery, water, heat, utilities, transportation, and other facilities and services necessary for proper execution and completion of the Work, whether temporary or permanent and whether or not incorporated or to be incorporated in the Work.

§ 3.4.2 Except in the case of minor changes in the Work approved by the Architect in accordance with Section 3.12.8 or ordered by the Architect in accordance with Section 7.4, the Contractor may make substitutions only with the consent of the Owner, after evaluation by the Architect and in accordance with a Change Order or Construction Change Directive.

§ 3.4.3 The Contractor shall enforce strict discipline and good order among the Contractor's employees and other persons carrying out the Work. The Contractor shall not permit employment of unfit persons or persons not properly skilled in tasks assigned to them.

§ 3.5 Warranty

§ 3.5.1 The Contractor warrants to the Owner and Architect that materials and equipment furnished under the Contract will be of good quality and new unless the Contract Documents require or permit otherwise. The Contractor further warrants that the Work will conform to the requirements of the Contract Documents and will be free from defects, except for those inherent in the quality of the Work the Contract Documents require or permit. Work, materials, or equipment not conforming to these requirements may be considered defective. The Contractor's warranty excludes

remedy for damage or defect caused by abuse, alterations to the Work not executed by the Contractor, improper or insufficient maintenance, improper operation, or normal wear and tear and normal usage. If required by the Architect, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment.

§ 3.5.2 All material, equipment, or other special warranties required by the Contract Documents shall be issued in the name of the Owner, or shall be transferable to the Owner, and shall commence in accordance with Section 9.8.4.

§ 3.6 Taxes

The Contractor shall pay sales, consumer, use and similar taxes for the Work provided by the Contractor that are legally enacted when bids are received or negotiations concluded, whether or not yet effective or merely scheduled to go into effect.

§ 3.7 Permits, Fees, Notices and Compliance with Laws

§ 3.7.1 Unless otherwise provided in the Contract Documents, the Contractor shall secure and pay for the building permit as well as for other permits, fees, licenses, and inspections by government agencies necessary for proper execution and completion of the Work that are customarily secured after execution of the Contract and legally required at the time bids are received or negotiations concluded.

§ 3.7.2 The Contractor shall comply with and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities applicable to performance of the Work.

§ 3.7.3 If the Contractor performs Work knowing it to be contrary to applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, the Contractor shall assume appropriate responsibility for such Work and shall bear the costs attributable to correction.

§ 3.7.4 Concealed or Unknown Conditions

If the Contractor encounters conditions at the site that are (1) subsurface or otherwise concealed physical conditions that differ materially from those indicated in the Contract Documents or (2) unknown physical conditions of an unusual nature that differ materially from those ordinarily found to exist and generally recognized as inherent in construction activities of the character provided for in the Contract Documents, the Contractor shall promptly provide notice to the Owner and the Architect before conditions are disturbed and in no event later than 14 days after first observance of the conditions. The Architect will promptly investigate such conditions and, if the Architect determines that they differ materially and cause an increase or decrease in the Contractor's cost of, or time required for, performance of any part of the Work, will recommend that an equitable adjustment be made in the Contract Sum or Contract Time, or both. If the Architect determines that the conditions at the site are not materially different from those indicated in the Contract Documents and that no change in the terms of the Contract is justified, the Architect shall promptly notify the Owner and Contractor, stating the reasons. If either party disputes the Architect's determination or recommendation, that party may submit a Claim as provided in Article 15.

§ 3.7.5 If, in the course of the Work, the Contractor encounters human remains or recognizes the existence of burial markers, archaeological sites or wetlands not indicated in the Contract Documents, the Contractor shall immediately suspend any operations that would affect them and shall notify the Owner and Architect. Upon receipt of such notice, the Owner shall promptly take any action necessary to obtain governmental authorization required to resume the operations. The Contractor shall continue to suspend such operations until otherwise instructed by the Owner but shall continue with all other operations that do not affect those remains or features. Requests for adjustments in the Contract Sum and Contract Time arising from the existence of such remains or features may be made as provided in Article 15.

§ 3.8 Allowances

§ 3.8.1 The Contractor shall include in the Contract Sum all allowances stated in the Contract Documents. Items covered by allowances shall be supplied for such amounts and by such persons or entities as the Owner may direct, but the Contractor shall not be required to employ persons or entities to whom the Contractor has reasonable objection.

§ 3.8.2 Unless otherwise provided in the Contract Documents,

.1 allowances shall cover the cost to the Contractor of materials and equipment delivered at the site and all required taxes, less applicable trade discounts;

.2 Contractor's costs for unloading and handling at the site, labor, installation costs, overhead, profit, and other expenses contemplated for stated allowance amounts shall be included in the Contract Sum but not in the allowances; and

.3 whenever costs are more than or less than allowances, the Contract Sum shall be adjusted accordingly by Change Order. The amount of the Change Order shall reflect (1) the difference between actual costs and the allowances under Section 3.8.2.1 and (2) changes in Contractor's costs under Section 3.8.2.2.

§ 3.8.3 Materials and equipment under an allowance shall be selected by the Owner with reasonable promptness.

§ 3.9 Superintendent

§ 3.9.1 The Contractor shall employ a competent superintendent and necessary assistants who shall be in attendance at the Project site during performance of the Work. The superintendent shall represent the Contractor, and communications given to the superintendent shall be as binding as if given to the Contractor.

§ 3.9.2 The Contractor, as soon as practicable after award of the Contract, shall notify the Owner and Architect of the name and qualifications of a proposed superintendent. Within 14 days of receipt of the information, the Architect may notify the Contractor, stating whether the Owner or the Architect (1) has reasonable objection to the proposed superintendent or (2) requires additional time for review. Failure of the Architect to provide notice within the 14-day period shall constitute notice of no reasonable objection.

§ 3.9.3 The Contractor shall not employ a proposed superintendent to whom the Owner or Architect has made reasonable and timely objection. The Contractor shall not change the superintendent without the Owner's consent, which shall not unreasonably be withheld or delayed.

§ 3.10 Contractor's Construction and Submittal Schedules

§ 3.10.1 The Contractor, promptly after being awarded the Contract, shall submit for the Owner's and Architect's information a Contractor's construction schedule for the Work. The schedule shall contain detail appropriate for the Project, including (1) the date of commencement of the Work, interim schedule milestone dates, and the date of Substantial Completion; (2) an apportionment of the Work by construction activity; and (3) the time required for completion of each portion of the Work. The schedule shall provide for the orderly progression of the Work to completion and shall not exceed time limits current under the Contract Documents. The schedule shall be revised at appropriate intervals as required by the conditions of the Work and Project.

§ 3.10.2 The Contractor, promptly after being awarded the Contract and thereafter as necessary to maintain a current submittal schedule, shall submit a submittal schedule for the Architect's approval. The Architect's approval shall not be unreasonably delayed or withheld. The submittal schedule shall (1) be coordinated with the Contractor's construction schedule, and (2) allow the Architect reasonable time to review submittals. If the Contractor fails to submit a submittal schedule, or fails to provide submittals in accordance with the approved submittal schedule, the Contractor shall not be entitled to any increase in Contract Sum or extension of Contract Time based on the time required for review of submittals.

§ 3.10.3 The Contractor shall perform the Work in general accordance with the most recent schedules submitted to the Owner and Architect.

§ 3.11 Documents and Samples at the Site

The Contractor shall make available, at the Project site, the Contract Documents, including Change Orders, Construction Change Directives, and other Modifications, in good order and marked currently to indicate field changes and selections made during construction, and the approved Shop Drawings, Product Data, Samples, and similar required submittals. These shall be in electronic form or paper copy, available to the Architect and Owner, and delivered to the Architect for submittal to the Owner upon completion of the Work as a record of the Work as constructed.

§ 3.12 Shop Drawings, Product Data and Samples

§ 3.12.1 Shop Drawings are drawings, diagrams, schedules, and other data specially prepared for the Work by the Contractor or a Subcontractor, Sub-subcontractor, manufacturer, supplier, or distributor to illustrate some portion of the Work.

§ 3.12.2 Product Data are illustrations, standard schedules, performance charts, instructions, brochures, diagrams, and other information furnished by the Contractor to illustrate materials or equipment for some portion of the Work.

§ 3.12.3 Samples are physical examples that illustrate materials, equipment, or workmanship, and establish standards by which the Work will be judged.

§ 3.12.4 Shop Drawings, Product Data, Samples, and similar submittals are not Contract Documents. Their purpose is to demonstrate how the Contractor proposes to conform to the information given and the design concept expressed in the Contract Documents for those portions of the Work for which the Contract Documents require submittals. Review by the Architect is subject to the limitations of Section 4.2.7. Informational submittals upon which the Architect is not expected to take responsive action may be so identified in the Contract Documents. Submittals that are not required by the Contract Documents may be returned by the Architect without action.

§ 3.12.5 The Contractor shall review for compliance with the Contract Documents, approve, and submit to the Architect, Shop Drawings, Product Data, Samples, and similar submittals required by the Contract Documents, in accordance with the submittal schedule approved by the Architect or, in the absence of an approved submittal schedule, with reasonable promptness and in such sequence as to cause no delay in the Work or in the activities of the Owner or of Separate Contractors.

§ 3.12.6 By submitting Shop Drawings, Product Data, Samples, and similar submittals, the Contractor represents to the Owner and Architect that the Contractor has (1) reviewed and approved them, (2) determined and verified materials, field measurements and field construction criteria related thereto, or will do so, and (3) checked and coordinated the information contained within such submittals with the requirements of the Work and of the Contract Documents.

§ 3.12.7 The Contractor shall perform no portion of the Work for which the Contract Documents require submittal and review of Shop Drawings, Product Data, Samples, or similar submittals, until the respective submittal has been approved by the Architect.

§ 3.12.8 The Work shall be in accordance with approved submittals except that the Contractor shall not be relieved of responsibility for deviations from the requirements of the Contract Documents by the Architect's approval of Shop Drawings, Product Data, Samples, or similar submittals, unless the Contractor has specifically notified the Architect of such deviation at the time of submittal and (1) the Architect has given written approval to the specific deviation as a minor change in the Work, or (2) a Change Order or Construction Change Directive has been issued authorizing the deviation. The Contractor shall not be relieved of responsibility for errors or omissions in Shop Drawings, Product Data, Samples, or similar submittals, by the Architect's approval thereof.

§ 3.12.9 The Contractor shall direct specific attention, in writing or on resubmitted Shop Drawings, Product Data, Samples, or similar submittals, to revisions other than those requested by the Architect on previous submittals. In the absence of such notice, the Architect's approval of a resubmission shall not apply to such revisions.

§ 3.12.10 The Contractor shall not be required to provide professional services that constitute the practice of architecture or engineering unless such services are specifically required by the Contract Documents for a portion of the Work or unless the Contractor needs to provide such services in order to carry out the Contractor's responsibilities for construction means, methods, techniques, sequences, and procedures. The Contractor shall not be required to provide professional services in violation of applicable law.

§ 3.12.10.1 If professional design services or certifications by a design professional related to systems, materials, or equipment are specifically required of the Contractor by the Contract Documents, the Owner and the Architect will specify all performance and design criteria that such services must satisfy. The Contractor shall be entitled to rely upon the adequacy and accuracy of the performance and design criteria provided in the Contract Documents. The Contractor shall cause such services or certifications to be provided by an appropriately licensed design professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, Shop Drawings, and other submittals prepared by such professional. Shop Drawings, and other submittals related to the Work, designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to the Architect. The Owner and the Architect shall be entitled to rely upon the adequacy and accuracy of the services, certifications, and approvals performed or provided by such design professionals, provided the Owner and Architect have specified to the Contractor the performance and design criteria that such services must satisfy. Pursuant to this Section 3.12.10, the Architect will review and approve or take other appropriate action on submittals only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents.

§ 3.12.10.2 If the Contract Documents require the Contractor's design professional to certify that the Work has been performed in accordance with the design criteria, the Contractor shall furnish such certifications to the Architect at the

time and in the form specified by the Architect.

§ 3.13 Use of Site

The Contractor shall confine operations at the site to areas permitted by applicable laws, statutes, ordinances, codes, rules and regulations, lawful orders of public authorities, and the Contract Documents and shall not unreasonably encumber the site with materials or equipment.

§ 3.14 Cutting and Patching

§ 3.14.1 The Contractor shall be responsible for cutting, fitting, or patching required to complete the Work or to make its parts fit together properly. All areas requiring cutting, fitting, or patching shall be restored to the condition existing prior to the cutting, fitting, or patching, unless otherwise required by the Contract Documents.

§ 3.14.2 The Contractor shall not damage or endanger a portion of the Work or fully or partially completed construction of the Owner or Separate Contractors by cutting, patching, or otherwise altering such construction, or by excavation. The Contractor shall not cut or otherwise alter construction by the Owner or a Separate Contractor except with written consent of the Owner and of the Separate Contractor. Consent shall not be unreasonably withheld. The Contractor shall not unreasonably withhold, from the Owner or a Separate Contractor, its consent to cutting or otherwise altering the Work.

§ 3.15 Cleaning Up

§ 3.15.1 The Contractor shall keep the premises and surrounding area free from accumulation of waste materials and rubbish caused by operations under the Contract. At completion of the Work, the Contractor shall remove waste materials, rubbish, the Contractor's tools, construction equipment, machinery, and surplus materials from and about the Project.

§ 3.15.2 If the Contractor fails to clean up as provided in the Contract Documents, the Owner may do so and the Owner shall be entitled to reimbursement from the Contractor.

§ 3.16 Access to Work

The Contractor shall provide the Owner and Architect with access to the Work in preparation and progress wherever located.

§ 3.17 Royalties, Patents and Copyrights

The Contractor shall pay all royalties and license fees. The Contractor shall defend suits or claims for infringement of copyrights and patent rights and shall hold the Owner and Architect harmless from loss on account thereof, but shall not be responsible for 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 the Owner or Architect. However, if an infringement of a copyright or patent is discovered by, or made known to, the Contractor, the Contractor shall be responsible for the loss unless the information is promptly furnished to the Architect.

§ 3.18 Indemnification

§ 3.18.1 To the fullest extent permitted by law, the Contractor shall indemnify and hold harmless the Owner, Architect, Architect's consultants, and agents and employees of any of them from and against claims, damages, losses, and expenses, including but not limited to attorneys' fees, arising out of or resulting from performance of the Work, provided that such claim, damage, loss, or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself), but only to the extent caused by the negligent acts or omissions of the Contractor, a Subcontractor, anyone directly or indirectly employed by them, or anyone for whose acts they may be liable, regardless of whether or not such claim, damage, loss, or expense is caused in part by a party indemnified hereunder. Such obligation shall not be construed to negate, abridge, or reduce other rights or obligations of indemnity that would otherwise exist as to a party or person described in this Section 3.18.

§ 3.18.2 In claims against any person or entity indemnified under this Section 3.18 by an employee of the Contractor, a Subcontractor, anyone directly or indirectly employed by them, or anyone for whose acts they may be liable, the indemnification obligation under Section 3.18.1 shall not be limited by a limitation on amount or type of damages, compensation, or benefits payable by or for the Contractor or a Subcontractor under workers' compensation acts, disability benefit acts, or other employee benefit acts.

ARTICLE 4 ARCHITECT

§ 4.1 General

§ 4.1.1 The Architect is the person or entity retained by the Owner pursuant to Section 2.3.2 and identified as such in the Agreement.

§ 4.1.2 Duties, responsibilities, and limitations of authority of the Architect as set forth in the Contract Documents shall not be restricted, modified, or extended without written consent of the Owner, Contractor, and Architect. Consent shall not be unreasonably withheld.

§ 4.2 Administration of the Contract

§ 4.2.1 The Architect will provide administration of the Contract as described in the Contract Documents and will be an Owner's representative during construction until the date the Architect issues the final Certificate for Payment. The Architect will have authority to act on behalf of the Owner only to the extent provided in the Contract Documents.

§ 4.2.2 The Architect will visit the site at intervals appropriate to the stage of construction, or as otherwise agreed with the Owner, to become generally familiar with the progress and quality of the portion of the Work completed, and to determine in general if the Work observed is being performed in a manner indicating that the Work, when fully completed, will be in accordance with the Contract Documents. However, the Architect will not be required to make exhaustive or continuous on-site inspections to check the quality or quantity of the Work. The Architect will not have control over, charge of, or responsibility for the construction means, methods, techniques, sequences or procedures, or for the safety precautions and programs in connection with the Work, since these are solely the Contractor's rights and responsibilities under the Contract Documents.

§ 4.2.3 On the basis of the site visits, the Architect will keep the Owner reasonably informed about the progress and quality of the portion of the Work completed, and promptly report to the Owner (1) known deviations from the Contract Documents, (2) known deviations from the most recent construction schedule submitted by the Contractor, and (3) defects and deficiencies observed in the Work. The Architect will not be responsible for the Contractor's failure to perform the Work in accordance with the requirements of the Contract Documents. The Architect will not have control over or charge of, and will not be responsible for acts or omissions of, the Contractor, Subcontractors, or their agents or employees, or any other persons or entities performing portions of the Work.

§ 4.2.4 Communications

The Owner and Contractor shall include the Architect in all communications that relate to or affect the Architect's services or professional responsibilities. The Owner shall promptly notify the Architect of the substance of any direct communications between the Owner and the Contractor otherwise relating to the Project. Communications by and with the Architect's consultants shall be through the Architect. Communications by and with Subcontractors and suppliers shall be through the Contractor. Communications by and with Separate Contractors shall be through the Owner. The Contract Documents may specify other communication protocols.

§ 4.2.5 Based on the Architect's evaluations of the Contractor's Applications for Payment, the Architect will review and certify the amounts due the Contractor and will issue Certificates for Payment in such amounts.

§ 4.2.6 The Architect has authority to reject Work that does not conform to the Contract Documents. Whenever the Architect considers it necessary or advisable, the Architect will have authority to require inspection or testing of the Work in accordance with Sections 13.4.2 and 13.4.3, whether or not the Work is fabricated, installed or completed. However, neither this authority of the Architect nor a decision made in good faith either to exercise or not to exercise such authority shall give rise to a duty or responsibility of the Architect to the Contractor, Subcontractors, suppliers, their agents or employees, or other persons or entities performing portions of the Work.

§ 4.2.7 The Architect will review and approve, or take other appropriate action upon, the Contractor's submittals such as Shop Drawings, Product Data, and Samples, but only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. The Architect's action will be taken in accordance with the submittal schedule approved by the Architect or, in the absence of an approved submittal schedule, with reasonable promptness while allowing sufficient time in the Architect's professional judgment to permit adequate review. Review of such submittals is not conducted for the purpose of determining the accuracy and completeness of other details such as dimensions and quantities, or for substantiating instructions for installation or performance of equipment or systems, all of which remain the responsibility of the Contractor as required by the Contract Documents. The Architect's review of the Contractor's submittals shall not relieve the Contractor of the obligations under

Sections 3.3, 3.5, and 3.12. The Architect's review shall not constitute approval of safety precautions or of any construction means, methods, techniques, sequences, or procedures. The Architect's approval of a specific item shall not indicate approval of an assembly of which the item is a component.

§ 4.2.8 The Architect will prepare Change Orders and Construction Change Directives, and may order minor changes in the Work as provided in Section 7.4. The Architect will investigate and make determinations and recommendations regarding concealed and unknown conditions as provided in Section 3.7.4.

§ 4.2.9 The Architect will conduct inspections to determine the date or dates of Substantial Completion and the date of final completion; issue Certificates of Substantial Completion pursuant to Section 9.8; receive and forward to the Owner, for the Owner's review and records, written warranties and related documents required by the Contract and assembled by the Contractor pursuant to Section 9.10; and issue a final Certificate for Payment pursuant to Section 9.10.

§ 4.2.10 If the Owner and Architect agree, the Architect will provide one or more Project representatives to assist in carrying out the Architect's responsibilities at the site. The Owner shall notify the Contractor of any change in the duties, responsibilities and limitations of authority of the Project representatives.

§ 4.2.11 The Architect will interpret and decide matters concerning performance under, and requirements of, the Contract Documents on written request of either the Owner or Contractor. The Architect's response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness.

§ 4.2.12 Interpretations and decisions of the Architect will be consistent with the intent of, and reasonably inferable from, the Contract Documents and will be in writing or in the form of drawings. When making such interpretations and decisions, the Architect will endeavor to secure faithful performance by both Owner and Contractor, will not show partiality to either, and will not be liable for results of interpretations or decisions rendered in good faith.

§ 4.2.13 The Architect's decisions on matters relating to aesthetic effect will be final if consistent with the intent expressed in the Contract Documents.

§ 4.2.14 The Architect will review and respond to requests for information about the Contract Documents. The Architect's response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness. If appropriate, the Architect will prepare and issue supplemental Drawings and Specifications in response to the requests for information.

ARTICLE 5 SUBCONTRACTORS

§ 5.1 Definitions

§ 5.1.1 A Subcontractor is a person or entity who has a direct contract with the Contractor to perform a portion of the Work at the site. The term "Subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Subcontractor or an authorized representative of the Subcontractor. The term "Subcontractor" does not include a Separate Contractor or the subcontractors of a Separate Contractor.

§ 5.1.2 A Sub-subcontractor is a person or entity who has a direct or indirect contract with a Subcontractor to perform a portion of the Work at the site. The term "Sub-subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Sub-subcontractor or an authorized representative of the Sub-subcontractor.

§ 5.2 Award of Subcontracts and Other Contracts for Portions of the Work

§ 5.2.1 Unless otherwise stated in the Contract Documents, the Contractor, as soon as practicable after award of the Contract, shall notify the Owner and Architect of the persons or entities proposed for each principal portion of the Work, including those who are to furnish materials or equipment fabricated to a special design. Within 14 days of receipt of the information, the Architect may notify the Contractor whether the Owner or the Architect (1) has reasonable objection to any such proposed person or entity or (2) requires additional time for review. Failure of the Architect to provide notice within the 14-day period shall constitute notice of no reasonable objection.

§ 5.2.2 The Contractor shall not contract with a proposed person or entity to whom the Owner or Architect has made reasonable and timely objection. The Contractor shall not be required to contract with anyone to whom the Contractor has made reasonable objection.

§ 5.2.3 If the Owner or Architect has reasonable objection to a person or entity proposed by the Contractor, the

Contractor shall propose another to whom the Owner or Architect has no reasonable objection. If the proposed but rejected Subcontractor was reasonably capable of performing the Work, the Contract Sum and Contract Time shall be increased or decreased by the difference, if any, occasioned by such change, and an appropriate Change Order shall be issued before commencement of the substitute Subcontractor's Work. However, no increase in the Contract Sum or Contract Time shall be allowed for such change unless the Contractor has acted promptly and responsively in submitting names as required.

§ 5.2.4 The Contractor shall not substitute a Subcontractor, person, or entity for one previously selected if the Owner or Architect makes reasonable objection to such substitution.

§ 5.3 Subcontractual Relations

By appropriate written agreement, the Contractor shall require each Subcontractor, to the extent of the Work to be performed by the Subcontractor, to be bound to the Contractor by terms of the Contract Documents, and to assume toward the Contractor all the obligations and responsibilities, including the responsibility for safety of the Subcontractor's Work that the Contractor, by these Contract Documents, assumes toward the Owner and Architect. Each subcontract agreement shall preserve and protect the rights of the Owner and Architect under the Contract Documents with respect to the Work to be performed by the Subcontractor so that subcontracting thereof will not prejudice such rights, and shall allow to the Subcontractor, unless specifically provided otherwise in the subcontract agreement, the benefit of all rights, remedies, and redress against the Contractor that the Contractor, by the Contract Documents, has against the Owner. Where appropriate, the Contractor shall require each Subcontractor to enter into similar agreements with Sub-subcontractors. The Contractor shall make available to each proposed Subcontractor, prior to the execution of the subcontract agreement, copies of the Contract Documents to which the Subcontractor will be bound, and, upon written request of the Subcontractor, identify to the Subcontractor terms and conditions of the proposed subcontract agreement that may be at variance with the Contract Documents. Subcontractors will similarly make copies of applicable portions of such documents available to their respective proposed Sub-subcontractors.

§ 5.4 Contingent Assignment of Subcontracts

§ 5.4.1 Each subcontract agreement for a portion of the Work is assigned by the Contractor to the Owner, provided that

.1 assignment is effective only after termination of the Contract by the Owner for cause pursuant to Section 14.2 and only for those subcontract agreements that the Owner accepts by notifying the Subcontractor and Contractor; and

.2 assignment is subject to the prior rights of the surety, if any, obligated under bond relating to the Contract.

When the Owner accepts the assignment of a subcontract agreement, the Owner assumes the Contractor's rights and obligations under the subcontract.

§ 5.4.2 Upon such assignment, if the Work has been suspended for more than 30 days, the Subcontractor's compensation shall be equitably adjusted for increases in cost resulting from the suspension.

§ 5.4.3 Upon assignment to the Owner under this Section 5.4, the Owner may further assign the subcontract to a successor contractor or other entity. If the Owner assigns the subcontract to a successor contractor or other entity, the Owner shall nevertheless remain legally responsible for all of the successor contractor's obligations under the subcontract.

ARTICLE 6 CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS

§ 6.1 Owner's Right to Perform Construction and to Award Separate Contracts

§ 6.1.1 The term "Separate Contractor(s)" shall mean other contractors retained by the Owner under separate agreements. The Owner reserves the right to perform construction or operations related to the Project with the Owner's own forces, and with Separate Contractors retained under Conditions of the Contract substantially similar to those of this Contract, including those provisions of the Conditions of the Contract related to insurance and waiver of subrogation.

§ 6.1.2 When separate contracts are awarded for different portions of the Project or other construction or operations on the site, the term "Contractor" in the Contract Documents in each case shall mean the Contractor who executes each separate Owner-Contractor Agreement.

§ 6.1.3 The Owner shall provide for coordination of the activities of the Owner's own forces and of each Separate

Contractor with the Work of the Contractor, who shall cooperate with them. The Contractor shall participate with any Separate Contractors and the Owner in reviewing their construction schedules. The Contractor shall make any revisions to its construction schedule deemed necessary after a joint review and mutual agreement. The construction schedules shall then constitute the schedules to be used by the Contractor, Separate Contractors, and the Owner until subsequently revised.

§ 6.1.4 Unless otherwise provided in the Contract Documents, when the Owner performs construction or operations related to the Project with the Owner's own forces or with Separate Contractors, the Owner or its Separate Contractors shall have the same obligations and rights that the Contractor has under the Conditions of the Contract, including, without excluding others, those stated in Article 3, this Article 6, and Articles 10, 11, and 12.

§ 6.2 Mutual Responsibility

§ 6.2.1 The Contractor shall afford the Owner and Separate Contractors reasonable opportunity for introduction and storage of their materials and equipment and performance of their activities, and shall connect and coordinate the Contractor's construction and operations with theirs as required by the Contract Documents.

§ 6.2.2 If part of the Contractor's Work depends for proper execution or results upon construction or operations by the Owner or a Separate Contractor, the Contractor shall, prior to proceeding with that portion of the Work, promptly notify the Architect of apparent discrepancies or defects in the construction or operations by the Owner or Separate Contractor that would render it unsuitable for proper execution and results of the Contractor's Work. Failure of the Contractor to notify the Architect of apparent discrepancies or defects prior to proceeding with the Work shall constitute an acknowledgment that the Owner's or Separate Contractor's completed or partially completed construction is fit and proper to receive the Contractor's Work. The Contractor shall not be responsible for discrepancies or defects in the construction or operations by the Owner or Separate Contractor that are not apparent.

§ 6.2.3 The Contractor shall reimburse the Owner for costs the Owner incurs that are payable to a Separate Contractor because of the Contractor's delays, improperly timed activities or defective construction. The Owner shall be responsible to the Contractor for costs the Contractor incurs because of a Separate Contractor's delays, improperly timed activities, damage to the Work or defective construction.

§ 6.2.4 The Contractor shall promptly remedy damage that the Contractor wrongfully causes to completed or partially completed construction or to property of the Owner or Separate Contractor as provided in Section 10.2.5.

§ 6.2.5 The Owner and each Separate Contractor shall have the same responsibilities for cutting and patching as are described for the Contractor in Section 3.14.

§ 6.3 Owner's Right to Clean Up

If a dispute arises among the Contractor, Separate Contractors, and the Owner as to the responsibility under their respective contracts for maintaining the premises and surrounding area free from waste materials and rubbish, the Owner may clean up and the Architect will allocate the cost among those responsible.

ARTICLE 7 CHANGES IN THE WORK

§ 7.1 General

§ 7.1.1 Changes in the Work may be accomplished after execution of the Contract, and without invalidating the Contract, by Change Order, Construction Change Directive or order for a minor change in the Work, subject to the limitations stated in this Article 7 and elsewhere in the Contract Documents.

§ 7.1.2 A Change Order shall be based upon agreement among the Owner, Contractor, and Architect. A Construction Change Directive requires agreement by the Owner and Architect and may or may not be agreed to by the Contractor. An order for a minor change in the Work may be issued by the Architect alone.

§ 7.1.3 Changes in the Work shall be performed under applicable provisions of the Contract Documents. The Contractor shall proceed promptly with changes in the Work, unless otherwise provided in the Change Order, Construction Change Directive, or order for a minor change in the Work.

§ 7.2 Change Orders

§ 7.2.1 A Change Order is a written instrument prepared by the Architect and signed by the Owner, Contractor, and Architect stating their agreement upon all of the following:

.1 The change in the Work;
.2 The amount of the adjustment, if any, in the Contract Sum; and
.3 The extent of the adjustment, if any, in the Contract Time.

§ 7.3 Construction Change Directives

§ 7.3.1 A Construction Change Directive is a written order prepared by the Architect and signed by the Owner and Architect, directing a change in the Work prior to agreement on adjustment, if any, in the Contract Sum or Contract Time, or both. The Owner may by Construction Change Directive, without invalidating the Contract, order changes in the Work within the general scope of the Contract consisting of additions, deletions, or other revisions, the Contract Sum and Contract Time being adjusted accordingly.

§ 7.3.2 A Construction Change Directive shall be used in the absence of total agreement on the terms of a Change Order.

§ 7.3.3 If the Construction Change Directive provides for an adjustment to the Contract Sum, the adjustment shall be based on one of the following methods:

.1 Mutual acceptance of a lump sum properly itemized and supported by sufficient substantiating data to permit evaluation;
.2 Unit prices stated in the Contract Documents or subsequently agreed upon;
.3 Cost to be determined in a manner agreed upon by the parties and a mutually acceptable fixed or percentage fee; or
.4 As provided in Section 7.3.4.

§ 7.3.4 If the Contractor does not respond promptly or disagrees with the method for adjustment in the Contract Sum, the Architect shall determine the adjustment on the basis of reasonable expenditures and savings of those performing the Work attributable to the change, including, in case of an increase in the Contract Sum, an amount for overhead and profit as set forth in the Agreement, or if no such amount is set forth in the Agreement, a reasonable amount. In such case, and also under Section 7.3.3.3, the Contractor shall keep and present, in such form as the Architect may prescribe, an itemized accounting together with appropriate supporting data. Unless otherwise provided in the Contract Documents, costs for the purposes of this Section 7.3.4 shall be limited to the following:

.1 Costs of labor, including applicable payroll taxes, fringe benefits required by agreement or custom, workers' compensation insurance, and other employee costs approved by the Architect;
.2 Costs of materials, supplies, and equipment, including cost of transportation, whether incorporated or consumed;
.3 Rental costs of machinery and equipment, exclusive of hand tools, whether rented from the Contractor or others;
.4 Costs of premiums for all bonds and insurance, permit fees, and sales, use, or similar taxes, directly related to the change; and
.5 Costs of supervision and field office personnel directly attributable to the change.

§ 7.3.5 If the Contractor disagrees with the adjustment in the Contract Time, the Contractor may make a Claim in accordance with applicable provisions of Article 15.

§ 7.3.6 Upon receipt of a Construction Change Directive, the Contractor shall promptly proceed with the change in the Work involved and advise the Architect of the Contractor's agreement or disagreement with the method, if any, provided in the Construction Change Directive for determining the proposed adjustment in the Contract Sum or Contract Time.

§ 7.3.7 A Construction Change Directive signed by the Contractor indicates the Contractor's agreement therewith, including adjustment in Contract Sum and Contract Time or the method for determining them. Such agreement shall be effective immediately and shall be recorded as a Change Order.

§ 7.3.8 The amount of credit to be allowed by the Contractor to the Owner for a deletion or change that results in a net decrease in the Contract Sum shall be actual net cost as confirmed by the Architect. When both additions and credits covering related Work or substitutions are involved in a change, the allowance for overhead and profit shall be figured on the basis of net increase, if any, with respect to that change.

§ 7.3.9 Pending final determination of the total cost of a Construction Change Directive to the Owner, the Contractor may request payment for Work completed under the Construction Change Directive in Applications for Payment. The

Architect will make an interim determination for purposes of monthly certification for payment for those costs and certify for payment the amount that the Architect determines, in the Architect's professional judgment, to be reasonably justified. The Architect's interim determination of cost shall adjust the Contract Sum on the same basis as a Change Order, subject to the right of either party to disagree and assert a Claim in accordance with Article 15.

§ 7.3.10 When the Owner and Contractor agree with a determination made by the Architect concerning the adjustments in the Contract Sum and Contract Time, or otherwise reach agreement upon the adjustments, such agreement shall be effective immediately and the Architect will prepare a Change Order. Change Orders may be issued for all or any part of a Construction Change Directive.

§ 7.4 Minor Changes in the Work

The Architect may order minor changes in the Work that are consistent with the intent of the Contract Documents and do not involve an adjustment in the Contract Sum or an extension of the Contract Time. The Architect's order for minor changes shall be in writing. If the Contractor believes that the proposed minor change in the Work will affect the Contract Sum or Contract Time, the Contractor shall notify the Architect and shall not proceed to implement the change in the Work. If the Contractor performs the Work set forth in the Architect's order for a minor change without prior notice to the Architect that such change will affect the Contract Sum or Contract Time, the Contractor waives any adjustment to the Contract Sum or extension of the Contract Time.

ARTICLE 8 TIME

§ 8.1 Definitions

§ 8.1.1 Unless otherwise provided, Contract Time is the period of time, including authorized adjustments, allotted in the Contract Documents for Substantial Completion of the Work.

§ 8.1.2 The date of commencement of the Work is the date established in the Agreement.

§ 8.1.3 The date of Substantial Completion is the date certified by the Architect in accordance with Section 9.8.

§ 8.1.4 The term "day" as used in the Contract Documents shall mean calendar day unless otherwise specifically defined.

§ 8.2 Progress and Completion

§ 8.2.1 Time limits stated in the Contract Documents are of the essence of the Contract. By executing the Agreement, the Contractor confirms that the Contract Time is a reasonable period for performing the Work.

§ 8.2.2 The Contractor shall not knowingly, except by agreement or instruction of the Owner in writing, commence the Work prior to the effective date of insurance required to be furnished by the Contractor and Owner.

§ 8.2.3 The Contractor shall proceed expeditiously with adequate forces and shall achieve Substantial Completion within the Contract Time.

§ 8.3 Delays and Extensions of Time

§ 8.3.1 If the Contractor is delayed at any time in the commencement or progress of the Work by (1) an act or neglect of the Owner or Architect, of an employee of either, or of a Separate Contractor; (2) by changes ordered in the Work; (3) by labor disputes, fire, unusual delay in deliveries, unavoidable casualties, adverse weather conditions documented in accordance with Section 15.1.6.2, or other causes beyond the Contractor's control; (4) by delay authorized by the Owner pending mediation and binding dispute resolution; or (5) by other causes that the Contractor asserts, and the Architect determines, justify delay, then the Contract Time shall be extended for such reasonable time as the Architect may determine.

§ 8.3.2 Claims relating to time shall be made in accordance with applicable provisions of Article 15.

§ 8.3.3 This Section 8.3 does not preclude recovery of damages for delay by either party under other provisions of the Contract Documents.

ARTICLE 9 PAYMENTS AND COMPLETION

§ 9.1 Contract Sum

§ 9.1.1 The Contract Sum is stated in the Agreement and, including authorized adjustments, is the total amount payable

by the Owner to the Contractor for performance of the Work under the Contract Documents.

§ 9.1.2 If unit prices are stated in the Contract Documents or subsequently agreed upon, and if quantities originally contemplated are materially changed so that application of such unit prices to the actual quantities causes substantial inequity to the Owner or Contractor, the applicable unit prices shall be equitably adjusted.

§ 9.2 Schedule of Values

Where the Contract is based on a stipulated sum or Guaranteed Maximum Price, the Contractor shall submit a schedule of values to the Architect before the first Application for Payment, allocating the entire Contract Sum to the various portions of the Work. The schedule of values shall be prepared in the form, and supported by the data to substantiate its accuracy, required by the Architect. This schedule, unless objected to by the Architect, shall be used as a basis for reviewing the Contractor's Applications for Payment. Any changes to the schedule of values shall be submitted to the Architect and supported by such data to substantiate its accuracy as the Architect may require, and unless objected to by the Architect, shall be used as a basis for reviewing the Contractor's subsequent Applications for Payment.

§ 9.3 Applications for Payment

§ 9.3.1 At least ten days before the date established for each progress payment, the Contractor shall submit to the Architect an itemized Application for Payment prepared in accordance with the schedule of values, if required under Section 9.2, for completed portions of the Work. The application shall be notarized, if required, and supported by all data substantiating the Contractor's right to payment that the Owner or Architect require, such as copies of requisitions, and releases and waivers of liens from Subcontractors and suppliers, and shall reflect retainage if provided for in the Contract Documents.

§ 9.3.1.1 As provided in Section 7.3.9, such applications may include requests for payment on account of changes in the Work that have been properly authorized by Construction Change Directives, or by interim determinations of the Architect, but not yet included in Change Orders.

§ 9.3.1.2 Applications for Payment shall not include requests for payment for portions of the Work for which the Contractor does not intend to pay a Subcontractor or supplier, unless such Work has been performed by others whom the Contractor intends to pay.

§ 9.3.2 Unless otherwise provided in the Contract Documents, payments shall be made on account of materials and equipment delivered and suitably stored at the site for subsequent incorporation in the Work. If approved in advance by the Owner, payment may similarly be made for materials and equipment suitably stored off the site at a location agreed upon in writing. Payment for materials and equipment stored on or off the site shall be conditioned upon compliance by the Contractor with procedures satisfactory to the Owner to establish the Owner's title to such materials and equipment or otherwise protect the Owner's interest, and shall include the costs of applicable insurance, storage, and transportation to the site, for such materials and equipment stored off the site.

§ 9.3.3 The Contractor warrants that title to all Work covered by an Application for Payment will pass to the Owner no later than the time of payment. The Contractor further warrants that upon submittal of an Application for Payment all Work for which Certificates for Payment have been previously issued and payments received from the Owner shall, to the best of the Contractor's knowledge, information, and belief, be free and clear of liens, claims, security interests, or encumbrances, in favor of the Contractor, Subcontractors, suppliers, or other persons or entities that provided labor, materials, and equipment relating to the Work.

§ 9.4 Certificates for Payment

§ 9.4.1 The Architect will, within seven days after receipt of the Contractor's Application for Payment, either (1) issue to the Owner a Certificate for Payment in the full amount of the Application for Payment, with a copy to the Contractor; or (2) issue to the Owner a Certificate for Payment for such amount as the Architect determines is properly due, and notify the Contractor and Owner of the Architect's reasons for withholding certification in part as provided in Section 9.5.1; or (3) withhold certification of the entire Application for Payment, and notify the Contractor and Owner of the Architect's reason for withholding certification in whole as provided in Section 9.5.1.

§ 9.4.2 The issuance of a Certificate for Payment will constitute a representation by the Architect to the Owner, based on the Architect's evaluation of the Work and the data in the Application for Payment, that, to the best of the Architect's knowledge, information, and belief, the Work has progressed to the point indicated, the quality of the Work is in accordance with the Contract Documents, and that the Contractor is entitled to payment in the amount certified. The

foregoing representations are subject to an evaluation of the Work for conformance with the Contract Documents upon Substantial Completion, to results of subsequent tests and inspections, to correction of minor deviations from the Contract Documents prior to completion, and to specific qualifications expressed by the Architect. However, the issuance of a Certificate for Payment will not be a representation that the Architect has (1) made exhaustive or continuous on-site inspections to check the quality or quantity of the Work; (2) reviewed construction means, methods, techniques, sequences, or procedures; (3) reviewed copies of requisitions received from Subcontractors and suppliers and other data requested by the Owner to substantiate the Contractor's right to payment; or (4) made examination to ascertain how or for what purpose the Contractor has used money previously paid on account of the Contract Sum.

§ 9.5 Decisions to Withhold Certification

§ 9.5.1 The Architect may withhold a Certificate for Payment in whole or in part, to the extent reasonably necessary to protect the Owner, if in the Architect's opinion the representations to the Owner required by Section 9.4.2 cannot be made. If the Architect is unable to certify payment in the amount of the Application, the Architect will notify the Contractor and Owner as provided in Section 9.4.1. If the Contractor and Architect cannot agree on a revised amount, the Architect will promptly issue a Certificate for Payment for the amount for which the Architect is able to make such representations to the Owner. The Architect may also withhold a Certificate for Payment or, because of subsequently discovered evidence, may nullify the whole or a part of a Certificate for Payment previously issued, to such extent as may be necessary in the Architect's opinion to protect the Owner from loss for which the Contractor is responsible, including loss resulting from acts and omissions described in Section 3.3.2, because of

.1 defective Work not remedied;
.2 third party claims filed or reasonable evidence indicating probable filing of such claims, unless security acceptable to the Owner is provided by the Contractor;
.3 failure of the Contractor to make payments properly to Subcontractors or suppliers for labor, materials or equipment;
.4 reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Sum;
.5 damage to the Owner or a Separate Contractor;
.6 reasonable evidence that the Work will not be completed within the Contract Time, and that the unpaid balance would not be adequate to cover actual or liquidated damages for the anticipated delay; or
.7 repeated failure to carry out the Work in accordance with the Contract Documents.

§ 9.5.2 When either party disputes the Architect's decision regarding a Certificate for Payment under Section 9.5.1, in whole or in part, that party may submit a Claim in accordance with Article 15.

§ 9.5.3 When the reasons for withholding certification are removed, certification will be made for amounts previously withheld.

§ 9.5.4 If the Architect withholds certification for payment under Section 9.5.1.3, the Owner may, at its sole option, issue joint checks to the Contractor and to any Subcontractor or supplier to whom the Contractor failed to make payment for Work properly performed or material or equipment suitably delivered. If the Owner makes payments by joint check, the Owner shall notify the Architect and the Contractor shall reflect such payment on its next Application for Payment.

§ 9.6 Progress Payments

§ 9.6.1 After the Architect has issued a Certificate for Payment, the Owner shall make payment in the manner and within the time provided in the Contract Documents, and shall so notify the Architect.

§ 9.6.2 The Contractor shall pay each Subcontractor, no later than seven days after receipt of payment from the Owner, the amount to which the Subcontractor is entitled, reflecting percentages actually retained from payments to the Contractor on account of the Subcontractor's portion of the Work. The Contractor shall, by appropriate agreement with each Subcontractor, require each Subcontractor to make payments to Sub-subcontractors in a similar manner.

§ 9.6.3 The Architect will, on request, furnish to a Subcontractor, if practicable, information regarding percentages of completion or amounts applied for by the Contractor and action taken thereon by the Architect and Owner on account of portions of the Work done by such Subcontractor.

§ 9.6.4 The Owner has the right to request written evidence from the Contractor that the Contractor has properly paid Subcontractors and suppliers amounts paid by the Owner to the Contractor for subcontracted Work. If the Contractor fails to furnish such evidence within seven days, the Owner shall have the right to contact Subcontractors and suppliers

to ascertain whether they have been properly paid. Neither the Owner nor Architect shall have an obligation to pay, or to see to the payment of money to, a Subcontractor or supplier, except as may otherwise be required by law.

§ 9.6.5 The Contractor's payments to suppliers shall be treated in a manner similar to that provided in Sections 9.6.2, 9.6.3 and 9.6.4.

§ 9.6.6 A Certificate for Payment, a progress payment, or partial or entire use or occupancy of the Project by the Owner shall not constitute acceptance of Work not in accordance with the Contract Documents.

§ 9.6.7 Unless the Contractor provides the Owner with a payment bond in the full penal sum of the Contract Sum, payments received by the Contractor for Work properly performed by Subcontractors or provided by suppliers shall be held by the Contractor for those Subcontractors or suppliers who performed Work or furnished materials, or both, under contract with the Contractor for which payment was made by the Owner. Nothing contained herein shall require money to be placed in a separate account and not commingled with money of the Contractor, create any fiduciary liability or tort liability on the part of the Contractor for breach of trust, or entitle any person or entity to an award of punitive damages against the Contractor for breach of the requirements of this provision.

§ 9.6.8 Provided the Owner has fulfilled its payment obligations under the Contract Documents, the Contractor shall defend and indemnify the Owner from all loss, liability, damage or expense, including reasonable attorney's fees and litigation expenses, arising out of any lien claim or other claim for payment by any Subcontractor or supplier of any tier. Upon receipt of notice of a lien claim or other claim for payment, the Owner shall notify the Contractor. If approved by the applicable court, when required, the Contractor may substitute a surety bond for the property against which the lien or other claim for payment has been asserted.

§ 9.7 Failure of Payment

If the Architect does not issue a Certificate for Payment, through no fault of the Contractor, within seven days after receipt of the Contractor's Application for Payment, or if the Owner does not pay the Contractor within seven days after the date established in the Contract Documents, the amount certified by the Architect or awarded by binding dispute resolution, then the Contractor may, upon seven additional days' notice to the Owner and Architect, stop the Work until payment of the amount owing has been received. The Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable costs of shutdown, delay and start-up, plus interest as provided for in the Contract Documents.

§ 9.8 Substantial Completion

§ 9.8.1 Substantial Completion is the stage in the progress of the Work when the Work or designated portion thereof is sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work for its intended use.

§ 9.8.2 When the Contractor considers that the Work, or a portion thereof which the Owner agrees to accept separately, is substantially complete, the Contractor shall prepare and submit to the Architect a comprehensive list of items to be completed or corrected prior to final payment. Failure to include an item on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents.

§ 9.8.3 Upon receipt of the Contractor's list, the Architect will make an inspection to determine whether the Work or designated portion thereof is substantially complete. If the Architect's inspection discloses any item, whether or not included on the Contractor's list, which is not sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work or designated portion thereof for its intended use, the Contractor shall, before issuance of the Certificate of Substantial Completion, complete or correct such item upon notification by the Architect. In such case, the Contractor shall then submit a request for another inspection by the Architect to determine Substantial Completion.

§ 9.8.4 When the Work or designated portion thereof is substantially complete, the Architect will prepare a Certificate of Substantial Completion that shall establish the date of Substantial Completion; establish responsibilities of the Owner and Contractor for security, maintenance, heat, utilities, damage to the Work and insurance; and fix the time within which the Contractor shall finish all items on the list accompanying the Certificate. Warranties required by the Contract Documents shall commence on the date of Substantial Completion of the Work or designated portion thereof unless otherwise provided in the Certificate of Substantial Completion.

§ 9.8.5 The Certificate of Substantial Completion shall be submitted to the Owner and Contractor for their written acceptance of responsibilities assigned to them in the Certificate. Upon such acceptance, and consent of surety if any, the Owner shall make payment of retainage applying to the Work or designated portion thereof. Such payment shall be adjusted for Work that is incomplete or not in accordance with the requirements of the Contract Documents.

§ 9.9 Partial Occupancy or Use

§ 9.9.1 The Owner may occupy or use any completed or partially completed portion of the Work at any stage when such portion is designated by separate agreement with the Contractor, provided such occupancy or use is consented to by the insurer and authorized by public authorities having jurisdiction over the Project. Such partial occupancy or use may commence whether or not the portion is substantially complete, provided the Owner and Contractor have accepted in writing the responsibilities assigned to each of them for payments, retainage, if any, security, maintenance, heat, utilities, damage to the Work and insurance, and have agreed in writing concerning the period for correction of the Work and commencement of warranties required by the Contract Documents. When the Contractor considers a portion substantially complete, the Contractor shall prepare and submit a list to the Architect as provided under Section 9.8.2. Consent of the Contractor to partial occupancy or use shall not be unreasonably withheld. The stage of the progress of the Work shall be determined by written agreement between the Owner and Contractor or, if no agreement is reached, by decision of the Architect.

§ 9.9.2 Immediately prior to such partial occupancy or use, the Owner, Contractor, and Architect shall jointly inspect the area to be occupied or portion of the Work to be used in order to determine and record the condition of the Work.

§ 9.9.3 Unless otherwise agreed upon, partial occupancy or use of a portion or portions of the Work shall not constitute acceptance of Work not complying with the requirements of the Contract Documents.

§ 9.10 Final Completion and Final Payment

§ 9.10.1 Upon receipt of the Contractor's notice that the Work is ready for final inspection and acceptance and upon receipt of a final Application for Payment, the Architect will promptly make such inspection. When the Architect finds the Work acceptable under the Contract Documents and the Contract fully performed, the Architect will promptly issue a final Certificate for Payment stating that to the best of the Architect's knowledge, information and belief, and on the basis of the Architect's on-site visits and inspections, the Work has been completed in accordance with the Contract Documents and that the entire balance found to be due the Contractor and noted in the final Certificate is due and payable. The Architect's final Certificate for Payment will constitute a further representation that conditions listed in Section 9.10.2 as precedent to the Contractor's being entitled to final payment have been fulfilled.

§ 9.10.2 Neither final payment nor any remaining retained percentage shall become due until the Contractor submits to the Architect (1) an affidavit that payrolls, bills for materials and equipment, and other indebtedness connected with the Work for which the Owner or the Owner's property might be responsible or encumbered (less amounts withheld by Owner) have been paid or otherwise satisfied, (2) a certificate evidencing that insurance required by the Contract Documents to remain in force after final payment is currently in effect, (3) a written statement that the Contractor knows of no reason that the insurance will not be renewable to cover the period required by the Contract Documents, (4) consent of surety, if any, to final payment, (5) documentation of any special warranties, such as manufacturers' warranties or specific Subcontractor warranties, and (6) if required by the Owner, other data establishing payment or satisfaction of obligations, such as receipts and releases and waivers of liens, claims, security interests, or encumbrances arising out of the Contract, to the extent and in such form as may be designated by the Owner. If a Subcontractor refuses to furnish a release or waiver required by the Owner, the Contractor may furnish a bond satisfactory to the Owner to indemnify the Owner against such lien, claim, security interest, or encumbrance. If a lien, claim, security interest, or encumbrance remains unsatisfied after payments are made, the Contractor shall refund to the Owner all money that the Owner may be compelled to pay in discharging the lien, claim, security interest, or encumbrance, including all costs and reasonable attorneys' fees.

§ 9.10.3 If, after Substantial Completion of the Work, final completion thereof is materially delayed through no fault of the Contractor or by issuance of Change Orders affecting final completion, and the Architect so confirms, the Owner shall, upon application by the Contractor and certification by the Architect, and without terminating the Contract, make payment of the balance due for that portion of the Work fully completed, corrected, and accepted. If the remaining balance for Work not fully completed or corrected is less than retainage stipulated in the Contract Documents, and if bonds have been furnished, the written consent of the surety to payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by the Contractor to the Architect prior to certification of such payment. Such payment shall be made under terms and conditions governing final payment, except that it shall not

constitute a waiver of Claims.

§ 9.10.4 The making of final payment shall constitute a waiver of Claims by the Owner except those arising from

.1 liens, Claims, security interests, or encumbrances arising out of the Contract and unsettled;
.2 failure of the Work to comply with the requirements of the Contract Documents;
.3 terms of special warranties required by the Contract Documents; or
.4 audits performed by the Owner, if permitted by the Contract Documents, after final payment.

§ 9.10.5 Acceptance of final payment by the Contractor, a Subcontractor, or a supplier, shall constitute a waiver of claims by that payee except those previously made in writing and identified by that payee as unsettled at the time of final Application for Payment.

ARTICLE 10 PROTECTION OF PERSONS AND PROPERTY

§ 10.1 Safety Precautions and Programs

The Contractor shall be responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the performance of the Contract.

§ 10.2 Safety of Persons and Property

§ 10.2.1 The Contractor shall take reasonable precautions for safety of, and shall provide reasonable protection to prevent damage, injury, or loss to

.1 employees on the Work and other persons who may be affected thereby;
.2 the Work and materials and equipment to be incorporated therein, whether in storage on or off the site, under care, custody, or control of the Contractor, a Subcontractor, or a Sub-subcontractor; and
.3 other property at the site or adjacent thereto, such as trees, shrubs, lawns, walks, pavements, roadways, structures, and utilities not designated for removal, relocation, or replacement in the course of construction.

§ 10.2.2 The Contractor shall comply with, and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities, bearing on safety of persons or property or their protection from damage, injury, or loss.

§ 10.2.3 The Contractor shall implement, erect, and maintain, as required by existing conditions and performance of the Contract, reasonable safeguards for safety and protection, including posting danger signs and other warnings against hazards; promulgating safety regulations; and notifying the owners and users of adjacent sites and utilities of the safeguards.

§ 10.2.4 When use or storage of explosives or other hazardous materials or equipment, or unusual methods are necessary for execution of the Work, the Contractor shall exercise utmost care and carry on such activities under supervision of properly qualified personnel.

§ 10.2.5 The Contractor shall promptly remedy damage and loss (other than damage or loss insured under property insurance required by the Contract Documents) to property referred to in Sections 10.2.1.2 and 10.2.1.3 caused in whole or in part by the Contractor, a Subcontractor, a Sub-subcontractor, or anyone directly or indirectly employed by any of them, or by anyone for whose acts they may be liable and for which the Contractor is responsible under Sections 10.2.1.2 and 10.2.1.3. The Contractor may make a Claim for the cost to remedy the damage or loss to the extent such damage or loss is attributable to acts or omissions of the Owner or Architect or anyone directly or indirectly employed by either of them, or by anyone for whose acts either of them may be liable, and not attributable to the fault or negligence of the Contractor. The foregoing obligations of the Contractor are in addition to the Contractor's obligations under Section 3.18.

§ 10.2.6 The Contractor shall designate a responsible member of the Contractor's organization at the site whose duty shall be the prevention of accidents. This person shall be the Contractor's superintendent unless otherwise designated by the Contractor in writing to the Owner and Architect.

§ 10.2.7 The Contractor shall not permit any part of the construction or site to be loaded so as to cause damage or create an unsafe condition.

§ 10.2.8 Injury or Damage to Person or Property

If either party suffers injury or damage to person or property because of an act or omission of the other party, or of others for whose acts such party is legally responsible, notice of the injury or damage, whether or not insured, shall be given to the other party within a reasonable time not exceeding 21 days after discovery. The notice shall provide sufficient detail to enable the other party to investigate the matter.

§ 10.3 Hazardous Materials and Substances

§ 10.3.1 The Contractor is responsible for compliance with any requirements included in the Contract Documents regarding hazardous materials or substances. If the Contractor encounters a hazardous material or substance not addressed in the Contract Documents and if reasonable precautions will be inadequate to prevent foreseeable bodily injury or death to persons resulting from a material or substance, including but not limited to asbestos or polychlorinated biphenyl (PCB), encountered on the site by the Contractor, the Contractor shall, upon recognizing the condition, immediately stop Work in the affected area and notify the Owner and Architect of the condition.

§ 10.3.2 Upon receipt of the Contractor's notice, the Owner shall obtain the services of a licensed laboratory to verify the presence or absence of the material or substance reported by the Contractor and, in the event such material or substance is found to be present, to cause it to be rendered harmless. Unless otherwise required by the Contract Documents, the Owner shall furnish in writing to the Contractor and Architect the names and qualifications of persons or entities who are to perform tests verifying the presence or absence of the material or substance or who are to perform the task of removal or safe containment of the material or substance. The Contractor and the Architect will promptly reply to the Owner in writing stating whether or not either has reasonable objection to the persons or entities proposed by the Owner. If either the Contractor or Architect has an objection to a person or entity proposed by the Owner, the Owner shall propose another to whom the Contractor and the Architect have no reasonable objection. When the material or substance has been rendered harmless, Work in the affected area shall resume upon written agreement of the Owner and Contractor. By Change Order, the Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable additional costs of shutdown, delay, and start-up.

§ 10.3.3 To the fullest extent permitted by law, the Owner shall indemnify and hold harmless the Contractor, Subcontractors, Architect, Architect's consultants, and agents and employees of any of them from and against claims, damages, losses, and expenses, including but not limited to attorneys' fees, arising out of or resulting from performance of the Work in the affected area if in fact the material or substance presents the risk of bodily injury or death as described in Section 10.3.1 and has not been rendered harmless, provided that such claim, damage, loss, or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself), except to the extent that such damage, loss, or expense is due to the fault or negligence of the party seeking indemnity.

§ 10.3.4 The Owner shall not be responsible under this Section 10.3 for hazardous materials or substances the Contractor brings to the site unless such materials or substances are required by the Contract Documents. The Owner shall be responsible for hazardous materials or substances required by the Contract Documents, except to the extent of the Contractor's fault or negligence in the use and handling of such materials or substances.

§ 10.3.5 The Contractor shall reimburse the Owner for the cost and expense the Owner incurs (1) for remediation of hazardous materials or substances the Contractor brings to the site and negligently handles, or (2) where the Contractor fails to perform its obligations under Section 10.3.1, except to the extent that the cost and expense are due to the Owner's fault or negligence.

§ 10.3.6 If, without negligence on the part of the Contractor, the Contractor is held liable by a government agency for the cost of remediation of a hazardous material or substance solely by reason of performing Work as required by the Contract Documents, the Owner shall reimburse the Contractor for all cost and expense thereby incurred.

§ 10.4 Emergencies

In an emergency affecting safety of persons or property, the Contractor shall act, at the Contractor's discretion, to prevent threatened damage, injury, or loss. Additional compensation or extension of time claimed by the Contractor on account of an emergency shall be determined as provided in Article 15 and Article 7.

ARTICLE 11 INSURANCE AND BONDS

§ 11.1 Contractor's Insurance and Bonds

§ 11.1.1 The Contractor shall purchase and maintain insurance of the types and limits of liability, containing the

endorsements, and subject to the terms and conditions, as described in the Agreement or elsewhere in the Contract Documents. The Contractor shall purchase and maintain the required insurance from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located. The Owner, Architect, and Architect's consultants shall be named as additional insureds under the Contractor's commercial general liability policy or as otherwise described in the Contract Documents.

§ 11.1.2 The Contractor shall provide surety bonds of the types, for such penal sums, and subject to such terms and conditions as required by the Contract Documents. The Contractor shall purchase and maintain the required bonds from a company or companies lawfully authorized to issue surety bonds in the jurisdiction where the Project is located.

§ 11.1.3 Upon the request of any person or entity appearing to be a potential beneficiary of bonds covering payment of obligations arising under the Contract, the Contractor shall promptly furnish a copy of the bonds or shall authorize a copy to be furnished.

§ 11.1.4 Notice of Cancellation or Expiration of Contractor's Required Insurance. Within three (3) business days of the date the Contractor becomes aware of an impending or actual cancellation or expiration of any insurance required by the Contract Documents, the Contractor shall provide notice to the Owner of such impending or actual cancellation or expiration. Upon receipt of notice from the Contractor, the Owner shall, unless the lapse in coverage arises from an act or omission of the Owner, have the right to stop the Work until the lapse in coverage has been cured by the procurement of replacement coverage by the Contractor. The furnishing of notice by the Contractor shall not relieve the Contractor of any contractual obligation to provide any required coverage.

§ 11.2 Owner's Insurance

§ 11.2.1 The Owner shall purchase and maintain insurance of the types and limits of liability, containing the endorsements, and subject to the terms and conditions, as described in the Agreement or elsewhere in the Contract Documents. The Owner shall purchase and maintain the required insurance from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located.

§ 11.2.2 Failure to Purchase Required Property Insurance. If the Owner fails to purchase and maintain the required property insurance, with all of the coverages and in the amounts described in the Agreement or elsewhere in the Contract Documents, the Owner shall inform the Contractor in writing prior to commencement of the Work. Upon receipt of notice from the Owner, the Contractor may delay commencement of the Work and may obtain insurance that will protect the interests of the Contractor, Subcontractors, and Sub-Subcontractors in the Work. When the failure to provide coverage has been cured or resolved, the Contract Sum and Contract Time shall be equitably adjusted. In the event the Owner fails to procure coverage, the Owner waives all rights against the Contractor, Subcontractors, and Sub-subcontractors to the extent the loss to the Owner would have been covered by the insurance to have been procured by the Owner. The cost of the insurance shall be charged to the Owner by a Change Order. If the Owner does not provide written notice, and the Contractor is damaged by the failure or neglect of the Owner to purchase or maintain the required insurance, the Owner shall reimburse the Contractor for all reasonable costs and damages attributable thereto.

§ 11.2.3 Notice of Cancellation or Expiration of Owner's Required Property Insurance. Within three (3) business days of the date the Owner becomes aware of an impending or actual cancellation or expiration of any property insurance required by the Contract Documents, the Owner shall provide notice to the Contractor of such impending or actual cancellation or expiration. Unless the lapse in coverage arises from an act or omission of the Contractor: (1) the Contractor, upon receipt of notice from the Owner, shall have the right to stop the Work until the lapse in coverage has been cured by the procurement of replacement coverage by either the Owner or the Contractor; (2) the Contract Time and Contract Sum shall be equitably adjusted; and (3) the Owner waives all rights against the Contractor, Subcontractors, and Sub-subcontractors to the extent any loss to the Owner would have been covered by the insurance had it not expired or been cancelled. If the Contractor purchases replacement coverage, the cost of the insurance shall be charged to the Owner by an appropriate Change Order. The furnishing of notice by the Owner shall not relieve the Owner of any contractual obligation to provide required insurance.

§ 11.3 Waivers of Subrogation

§ 11.3.1 The Owner and Contractor waive all rights against (1) each other and any of their subcontractors, sub-subcontractors, agents, and employees, each of the other; (2) the Architect and Architect's consultants; and (3) Separate Contractors, if any, and any of their subcontractors, sub-subcontractors, agents, and employees, for damages caused by fire, or other causes of loss, to the extent those losses are covered by property insurance required by the Agreement or other property insurance applicable to the Project, except such rights as they have to proceeds of such insurance. The

Owner or Contractor, as appropriate, shall require similar written waivers in favor of the individuals and entities identified above from the Architect, Architect's consultants, Separate Contractors, subcontractors, and sub-subcontractors. The policies of insurance purchased and maintained by each person or entity agreeing to waive claims pursuant to this section 11.3.1 shall not prohibit this waiver of subrogation. This waiver of subrogation shall be effective as to a person or entity (1) even though that person or entity would otherwise have a duty of indemnification, contractual or otherwise, (2) even though that person or entity did not pay the insurance premium directly or indirectly, or (3) whether or not the person or entity had an insurable interest in the damaged property.

§ 11.3.2 If during the Project construction period the Owner insures properties, real or personal or both, at or adjacent to the site by property insurance under policies separate from those insuring the Project, or if after final payment property insurance is to be provided on the completed Project through a policy or policies other than those insuring the Project during the construction period, to the extent permissible by such policies, the Owner waives all rights in accordance with the terms of Section 11.3.1 for damages caused by fire or other causes of loss covered by this separate property insurance.

§ 11.4 Loss of Use, Business Interruption, and Delay in Completion Insurance

The Owner, at the Owner's option, may purchase and maintain insurance that will protect the Owner against loss of use of the Owner's property, or the inability to conduct normal operations, due to fire or other causes of loss. The Owner waives all rights of action against the Contractor and Architect for loss of use of the Owner's property, due to fire or other hazards however caused.

§11.5 Adjustment and Settlement of Insured Loss

§ 11.5.1 A loss insured under the property insurance required by the Agreement shall be adjusted by the Owner as fiduciary and made payable to the Owner as fiduciary for the insureds, as their interests may appear, subject to requirements of any applicable mortgagee clause and of Section 11.5.2. The Owner shall pay the Architect and Contractor their just shares of insurance proceeds received by the Owner, and by appropriate agreements the Architect and Contractor shall make payments to their consultants and Subcontractors in similar manner.

§ 11.5.2 Prior to settlement of an insured loss, the Owner shall notify the Contractor of the terms of the proposed settlement as well as the proposed allocation of the insurance proceeds. The Contractor shall have 14 days from receipt of notice to object to the proposed settlement or allocation of the proceeds. If the Contractor does not object, the Owner shall settle the loss and the Contractor shall be bound by the settlement and allocation. Upon receipt, the Owner shall deposit the insurance proceeds in a separate account and make the appropriate distributions. Thereafter, if no other agreement is made or the Owner does not terminate the Contract for convenience, the Owner and Contractor shall execute a Change Order for reconstruction of the damaged or destroyed Work in the amount allocated for that purpose. If the Contractor timely objects to either the terms of the proposed settlement or the allocation of the proceeds, the Owner may proceed to settle the insured loss, and any dispute between the Owner and Contractor arising out of the settlement or allocation of the proceeds shall be resolved pursuant to Article 15. Pending resolution of any dispute, the Owner may issue a Construction Change Directive for the reconstruction of the damaged or destroyed Work.

ARTICLE 12 UNCOVERING AND CORRECTION OF WORK

§ 12.1 Uncovering of Work

§ 12.1.1 If a portion of the Work is covered contrary to the Architect's request or to requirements specifically expressed in the Contract Documents, it must, if requested in writing by the Architect, be uncovered for the Architect's examination and be replaced at the Contractor's expense without change in the Contract Time.

§ 12.1.2 If a portion of the Work has been covered that the Architect has not specifically requested to examine prior to its being covered, the Architect may request to see such Work and it shall be uncovered by the Contractor. If such Work is in accordance with the Contract Documents, the Contractor shall be entitled to an equitable adjustment to the Contract Sum and Contract Time as may be appropriate. If such Work is not in accordance with the Contract Documents, the costs of uncovering the Work, and the cost of correction, shall be at the Contractor's expense.

§ 12.2 Correction of Work

§ 12.2.1 Before Substantial Completion

The Contractor shall promptly correct Work rejected by the Architect or failing to conform to the requirements of the Contract Documents, discovered before Substantial Completion and whether or not fabricated, installed or completed. Costs of correcting such rejected Work, including additional testing and inspections, the cost of uncovering and replacement, and compensation for the Architect's services and expenses made necessary thereby, shall be at the

Contractor's expense.

§ 12.2.2 After Substantial Completion

§ 12.2.2.1 In addition to the Contractor's obligations under Section 3.5, if, within one year after the date of Substantial Completion of the Work or designated portion thereof or after the date for commencement of warranties established under Section 9.9.1, or by terms of any applicable special warranty required by the Contract Documents, any of the Work is found to be not in accordance with the requirements of the Contract Documents, the Contractor shall correct it promptly after receipt of notice from the Owner to do so, unless the Owner has previously given the Contractor a written acceptance of such condition. The Owner shall give such notice promptly after discovery of the condition. During the one-year period for correction of Work, if the Owner fails to notify the Contractor and give the Contractor an opportunity to make the correction, the Owner waives the rights to require correction by the Contractor and to make a claim for breach of warranty. If the Contractor fails to correct nonconforming Work within a reasonable time during that period after receipt of notice from the Owner or Architect, the Owner may correct it in accordance with Section 2.5.

§ 12.2.2.2 The one-year period for correction of Work shall be extended with respect to portions of Work first performed after Substantial Completion by the period of time between Substantial Completion and the actual completion of that portion of the Work.

§ 12.2.2.3 The one-year period for correction of Work shall not be extended by corrective Work performed by the Contractor pursuant to this Section 12.2.

§ 12.2.3 The Contractor shall remove from the site portions of the Work that are not in accordance with the requirements of the Contract Documents and are neither corrected by the Contractor nor accepted by the Owner.

§ 12.2.4 The Contractor shall bear the cost of correcting destroyed or damaged construction of the Owner or Separate Contractors, whether completed or partially completed, caused by the Contractor's correction or removal of Work that is not in accordance with the requirements of the Contract Documents.

§ 12.2.5 Nothing contained in this Section 12.2 shall be construed to establish a period of limitation with respect to other obligations the Contractor has under the Contract Documents. Establishment of the one-year period for correction of Work as described in Section 12.2.2 relates only to the specific obligation of the Contractor to correct the Work, and has no relationship to the time within which the obligation to comply with the Contract Documents may be sought to be enforced, nor to the time within which proceedings may be commenced to establish the Contractor's liability with respect to the Contractor's obligations other than specifically to correct the Work.

§ 12.3 Acceptance of Nonconforming Work

If the Owner prefers to accept Work that is not in accordance with the requirements of the Contract Documents, the Owner may do so instead of requiring its removal and correction, in which case the Contract Sum will be reduced as appropriate and equitable. Such adjustment shall be effected whether or not final payment has been made.

ARTICLE 13 MISCELLANEOUS PROVISIONS

§ 13.1 Governing Law

The Contract shall be governed by the law of the place where the Project is located, excluding that jurisdiction's choice of law rules. If the parties have selected arbitration as the method of binding dispute resolution, the Federal Arbitration Act shall govern Section 15.4.

§ 13.2 Successors and Assigns

§ 13.2.1 The Owner and Contractor respectively bind themselves, their partners, successors, assigns, and legal representatives to covenants, agreements, and obligations contained in the Contract Documents. Except as provided in Section 13.2.2, neither party to the Contract shall assign the Contract as a whole without written consent of the other. If either party attempts to make an assignment without such consent, that party shall nevertheless remain legally responsible for all obligations under the Contract.

§ 13.2.2 The Owner may, without consent of the Contractor, assign the Contract to a lender providing construction financing for the Project, if the lender assumes the Owner's rights and obligations under the Contract Documents. The Contractor shall execute all consents reasonably required to facilitate the assignment.

§ 13.3 Rights and Remedies

§ 13.3.1 Duties and obligations imposed by the Contract Documents and rights and remedies available thereunder shall be in addition to and not a limitation of duties, obligations, rights, and remedies otherwise imposed or available by law.

§ 13.3.2 No action or failure to act by the Owner, Architect, or Contractor shall constitute a waiver of a right or duty afforded them under the Contract, nor shall such action or failure to act constitute approval of or acquiescence in a breach thereunder, except as may be specifically agreed upon in writing.

§ 13.4 Tests and Inspections

§ 13.4.1 Tests, inspections, and approvals of portions of the Work shall be made as required by the Contract Documents and by applicable laws, statutes, ordinances, codes, rules, and regulations or lawful orders of public authorities. Unless otherwise provided, the Contractor shall make arrangements for such tests, inspections, and approvals with an independent testing laboratory or entity acceptable to the Owner, or with the appropriate public authority, and shall bear all related costs of tests, inspections, and approvals. The Contractor shall give the Architect timely notice of when and where tests and inspections are to be made so that the Architect may be present for such procedures. The Owner shall bear costs of tests, inspections, or approvals that do not become requirements until after bids are received or negotiations concluded. The Owner shall directly arrange and pay for tests, inspections, or approvals where building codes or applicable laws or regulations so require.

§ 13.4.2 If the Architect, Owner, or public authorities having jurisdiction determine that portions of the Work require additional testing, inspection, or approval not included under Section 13.4.1, the Architect will, upon written authorization from the Owner, instruct the Contractor to make arrangements for such additional testing, inspection, or approval, by an entity acceptable to the Owner, and the Contractor shall give timely notice to the Architect of when and where tests and inspections are to be made so that the Architect may be present for such procedures. Such costs, except as provided in Section 13.4.3, shall be at the Owner's expense.

§ 13.4.3 If procedures for testing, inspection, or approval under Sections 13.4.1 and 13.4.2 reveal failure of the portions of the Work to comply with requirements established by the Contract Documents, all costs made necessary by such failure, including those of repeated procedures and compensation for the Architect's services and expenses, shall be at the Contractor's expense.

§ 13.4.4 Required certificates of testing, inspection, or approval shall, unless otherwise required by the Contract Documents, be secured by the Contractor and promptly delivered to the Architect.

§ 13.4.5 If the Architect is to observe tests, inspections, or approvals required by the Contract Documents, the Architect will do so promptly and, where practicable, at the normal place of testing.

§ 13.4.6 Tests or inspections conducted pursuant to the Contract Documents shall be made promptly to avoid unreasonable delay in the Work.

§ 13.5 Interest

Payments due and unpaid under the Contract Documents shall bear interest from the date payment is due at the rate the parties agree upon in writing or, in the absence thereof, at the legal rate prevailing from time to time at the place where the Project is located.

ARTICLE 14 TERMINATION OR SUSPENSION OF THE CONTRACT

§ 14.1 Termination by the Contractor

§ 14.1.1 The Contractor may terminate the Contract if the Work is stopped for a period of 30 consecutive days through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, their agents or employees, or any other persons or entities performing portions of the Work, for any of the following reasons:

.1 Issuance of an order of a court or other public authority having jurisdiction that requires all Work to be stopped;

.2 An act of government, such as a declaration of national emergency, that requires all Work to be stopped;

.3 Because the Architect has not issued a Certificate for Payment and has not notified the Contractor of the reason for withholding certification as provided in Section 9.4.1, or because the Owner has not made payment on a Certificate for Payment within the time stated in the Contract Documents; or

.4 The Owner has failed to furnish to the Contractor reasonable evidence as required by Section 2.2.

§ 14.1.2 The Contractor may terminate the Contract if, through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, their agents or employees, or any other persons or entities performing portions of the Work, repeated suspensions, delays, or interruptions of the entire Work by the Owner as described in Section 14.3, constitute in the aggregate more than 100 percent of the total number of days scheduled for completion, or 120 days in any 365-day period, whichever is less.

§ 14.1.3 If one of the reasons described in Section 14.1.1 or 14.1.2 exists, the Contractor may, upon seven days' notice to the Owner and Architect, terminate the Contract and recover from the Owner payment for Work executed, as well as reasonable overhead and profit on Work not executed, and costs incurred by reason of such termination.

§ 14.1.4 If the Work is stopped for a period of 60 consecutive days through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, or their agents or employees or any other persons or entities performing portions of the Work because the Owner has repeatedly failed to fulfill the Owner's obligations under the Contract Documents with respect to matters important to the progress of the Work, the Contractor may, upon seven additional days' notice to the Owner and the Architect, terminate the Contract and recover from the Owner as provided in Section 14.1.3.

§ 14.2 Termination by the Owner for Cause

§ 14.2.1 The Owner may terminate the Contract if the Contractor

.1 repeatedly refuses or fails to supply enough properly skilled workers or proper materials;

.2 fails to make payment to Subcontractors or suppliers in accordance with the respective agreements between the Contractor and the Subcontractors or suppliers;

.3 repeatedly disregards applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of a public authority; or

.4 otherwise is guilty of substantial breach of a provision of the Contract Documents.

§ 14.2.2 When any of the reasons described in Section 14.2.1 exist, and upon certification by the Architect that sufficient cause exists to justify such action, the Owner may, without prejudice to any other rights or remedies of the Owner and after giving the Contractor and the Contractor's surety, if any, seven days' notice, terminate employment of the Contractor and may, subject to any prior rights of the surety:

.1 Exclude the Contractor from the site and take possession of all materials, equipment, tools, and construction equipment and machinery thereon owned by the Contractor;

.2 Accept assignment of subcontracts pursuant to Section 5.4; and

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

§ 14.2.3 When the Owner terminates the Contract for one of the reasons stated in Section 14.2.1, the Contractor shall not be entitled to receive further payment until the Work is finished.

§ 14.2.4 If the unpaid balance of the Contract Sum exceeds costs of finishing the Work, including compensation for the Architect's services and expenses made necessary thereby, and other damages incurred by the Owner and not expressly waived, such excess shall be paid to the Contractor. If such costs and damages exceed the unpaid balance, the Contractor shall pay the difference to the Owner. The amount to be paid to the Contractor or Owner, as the case may be, shall be certified by the Initial Decision Maker, upon application, and this obligation for payment shall survive termination of the Contract.

§ 14.3 Suspension by the Owner for Convenience

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

§ 14.3.2 The Contract Sum and Contract Time shall be adjusted for increases in the cost and time caused by suspension, delay, or interruption under Section 14.3.1. Adjustment of the Contract Sum shall include profit. No adjustment shall be made to the extent

.1 that performance is, was, or would have been, so suspended, delayed, or interrupted, by another cause for which the Contractor is responsible; or

.2 that an equitable adjustment is made or denied under another provision of the Contract.

§ 14.4 Termination by the Owner for Convenience

§ 14.4.1 The Owner may, at any time, terminate the Contract for the Owner's convenience and without cause.

§ 14.4.2 Upon receipt of notice from the Owner of such termination for the Owner's convenience, the Contractor shall

.1 cease operations as directed by the Owner in the notice;

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

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

§ 14.4.3 In case of such termination for the Owner's convenience, the Owner shall pay the Contractor for Work properly executed; costs incurred by reason of the termination, including costs attributable to termination of Subcontracts; and the termination fee, if any, set forth in the Agreement.

ARTICLE 15 CLAIMS AND DISPUTES

§ 15.1 Claims

§ 15.1.1 Definition

A Claim is a demand or assertion by one of the parties seeking, as a matter of right, payment of money, a change in the Contract Time, or other relief with respect to the terms of the Contract. The term "Claim" also includes other disputes and matters in question between the Owner and Contractor arising out of or relating to the Contract. The responsibility to substantiate Claims shall rest with the party making the Claim. This Section 15.1.1 does not require the Owner to file a Claim in order to impose liquidated damages in accordance with the Contract Documents.

§ 15.1.2 Time Limits on Claims

The Owner and Contractor shall commence all Claims and causes of action against the other and arising out of or related to the Contract, whether in contract, tort, breach of warranty or otherwise, in accordance with the requirements of the binding dispute resolution method selected in the Agreement and within the period specified by applicable law, but in any case not more than 10 years after the date of Substantial Completion of the Work. The Owner and Contractor waive all Claims and causes of action not commenced in accordance with this Section 15.1.2.

§ 15.1.3 Notice of Claims

§ 15.1.3.1 Claims by either the Owner or Contractor, where the condition giving rise to the Claim is first discovered prior to expiration of the period for correction of the Work set forth in Section 12.2.2, shall be initiated by notice to the other party and to the Initial Decision Maker with a copy sent to the Architect, if the Architect is not serving as the Initial Decision Maker. Claims by either party under this Section 15.1.3.1 shall be initiated within 21 days after occurrence of the event giving rise to such Claim or within 21 days after the claimant first recognizes the condition giving rise to the Claim, whichever is later.

§ 15.1.3.2 Claims by either the Owner or Contractor, where the condition giving rise to the Claim is first discovered after expiration of the period for correction of the Work set forth in Section 12.2.2, shall be initiated by notice to the other party. In such event, no decision by the Initial Decision Maker is required.

§ 15.1.4 Continuing Contract Performance

§ 15.1.4.1 Pending final resolution of a Claim, except as otherwise agreed in writing or as provided in Section 9.7 and Article 14, the Contractor shall proceed diligently with performance of the Contract and the Owner shall continue to make payments in accordance with the Contract Documents.

§ 15.1.4.2 The Contract Sum and Contract Time shall be adjusted in accordance with the Initial Decision Maker's decision, subject to the right of either party to proceed in accordance with this Article 15. The Architect will issue Certificates for Payment in accordance with the decision of the Initial Decision Maker.

§ 15.1.5 Claims for Additional Cost

If the Contractor wishes to make a Claim for an increase in the Contract Sum, notice as provided in Section 15.1.3 shall be given before proceeding to execute the portion of the Work that is the subject of the Claim. Prior notice is not required for Claims relating to an emergency endangering life or property arising under Section 10.4.

§ 15.1.6 Claims for Additional Time

§ 15.1.6.1 If the Contractor wishes to make a Claim for an increase in the Contract Time, notice as provided in Section

15.1.3 shall be given. The Contractor's Claim shall include an estimate of cost and of probable effect of delay on progress of the Work. In the case of a continuing delay, only one Claim is necessary.

§ 15.1.6.2 If adverse weather conditions are the basis for a Claim for additional time, such Claim shall be documented by data substantiating that weather conditions were abnormal for the period of time, could not have been reasonably anticipated, and had an adverse effect on the scheduled construction.

§ 15.1.7 Waiver of Claims for Consequential Damages

The Contractor and Owner waive Claims against each other for consequential damages arising out of or relating to this Contract. This mutual waiver includes

.1 damages incurred by the Owner for rental expenses, for losses of use, income, profit, financing, business and reputation, and for loss of management or employee productivity or of the services of such persons; and

.2 damages incurred by the Contractor for principal office expenses including the compensation of personnel stationed there, for losses of financing, business and reputation, and for loss of profit, except anticipated profit arising directly from the Work.

This mutual waiver is applicable, without limitation, to all consequential damages due to either party's termination in accordance with Article 14. Nothing contained in this Section 15.1.7 shall be deemed to preclude assessment of liquidated damages, when applicable, in accordance with the requirements of the Contract Documents.

§ 15.2 Initial Decision

§ 15.2.1 Claims, excluding those where the condition giving rise to the Claim is first discovered after expiration of the period for correction of the Work set forth in Section 12.2.2 or arising under Sections 10.3, 10.4, and 11.5, shall be referred to the Initial Decision Maker for initial decision. The Architect will serve as the Initial Decision Maker, unless otherwise indicated in the Agreement. Except for those Claims excluded by this Section 15.2.1, an initial decision shall be required as a condition precedent to mediation of any Claim. If an initial decision has not been rendered within 30 days after the Claim has been referred to the Initial Decision Maker, the party asserting the Claim may demand mediation and binding dispute resolution without a decision having been rendered. Unless the Initial Decision Maker and all affected parties agree, the Initial Decision Maker will not decide disputes between the Contractor and persons or entities other than the Owner.

§ 15.2.2 The Initial Decision Maker will review Claims and within ten days of the receipt of a Claim take one or more of the following actions: (1) request additional supporting data from the claimant or a response with supporting data from the other party, (2) reject the Claim in whole or in part, (3) approve the Claim, (4) suggest a compromise, or (5) advise the parties that the Initial Decision Maker is unable to resolve the Claim if the Initial Decision Maker lacks sufficient information to evaluate the merits of the Claim or if the Initial Decision Maker concludes that, in the Initial Decision Maker's sole discretion, it would be inappropriate for the Initial Decision Maker to resolve the Claim.

§ 15.2.3 In evaluating Claims, the Initial Decision Maker may, but shall not be obligated to, consult with or seek information from either party or from persons with special knowledge or expertise who may assist the Initial Decision Maker in rendering a decision. The Initial Decision Maker may request the Owner to authorize retention of such persons at the Owner's expense.

§ 15.2.4 If the Initial Decision Maker requests a party to provide a response to a Claim or to furnish additional supporting data, such party shall respond, within ten days after receipt of the request, and shall either (1) provide a response on the requested supporting data, (2) advise the Initial Decision Maker when the response or supporting data will be furnished, or (3) advise the Initial Decision Maker that no supporting data will be furnished. Upon receipt of the response or supporting data, if any, the Initial Decision Maker will either reject or approve the Claim in whole or in part.

§ 15.2.5 The Initial Decision Maker will render an initial decision approving or rejecting the Claim, or indicating that the Initial Decision Maker is unable to resolve the Claim. This initial decision shall (1) be in writing; (2) state the reasons therefor; and (3) notify the parties and the Architect, if the Architect is not serving as the Initial Decision Maker, of any change in the Contract Sum or Contract Time or both. The initial decision shall be final and binding on the parties but subject to mediation and, if the parties fail to resolve their dispute through mediation, to binding dispute resolution.

§ 15.2.6 Either party may file for mediation of an initial decision at any time, subject to the terms of Section 15.2.6.1.

§ 15.2.6.1 Either party may, within 30 days from the date of receipt of an initial decision, demand in writing that the other party file for mediation. If such a demand is made and the party receiving the demand fails to file for mediation within 30 days after receipt thereof, then both parties waive their rights to mediate or pursue binding dispute resolution proceedings with respect to the initial decision.

§ 15.2.7 In the event of a Claim against the Contractor, the Owner may, but is not obligated to, notify the surety, if any, of the nature and amount of the Claim. If the Claim relates to a possibility of a Contractor's default, the Owner may, but is not obligated to, notify the surety and request the surety's assistance in resolving the controversy.

§ 15.2.8 If a Claim relates to or is the subject of a mechanic's lien, the party asserting such Claim may proceed in accordance with applicable law to comply with the lien notice or filing deadlines.

§ 15.3 Mediation

§ 15.3.1 Claims, disputes, or other matters in controversy arising out of or related to the Contract, except those waived as provided for in Sections 9.10.4, 9.10.5, and 15.1.7, shall be subject to mediation as a condition precedent to binding dispute resolution.

§ 15.3.2 The parties shall endeavor to resolve their Claims by mediation which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with its Construction Industry Mediation Procedures in effect on the date of the Agreement. A request for mediation shall be made in writing, delivered to the other party to the Contract, and filed with the person or entity administering the mediation. The request may be made concurrently with the filing of binding dispute resolution proceedings but, in such event, mediation shall proceed in advance of binding dispute resolution proceedings, which shall be stayed pending mediation for a period of 60 days from the date of filing, unless stayed for a longer period by agreement of the parties or court order. If an arbitration is stayed pursuant to this Section 15.3.2, the parties may nonetheless proceed to the selection of the arbitrator(s) and agree upon a schedule for later proceedings.

§ 15.3.3 Either party may, within 30 days from the date that mediation has been concluded without resolution of the dispute or 60 days after mediation has been demanded without resolution of the dispute, demand in writing that the other party file for binding dispute resolution. If such a demand is made and the party receiving the demand fails to file for binding dispute resolution within 60 days after receipt thereof, then both parties waive their rights to binding dispute resolution proceedings with respect to the initial decision.

§ 15.3.4 The parties shall share the mediator's fee and any filing fees equally. The mediation shall be held in the place where the Project is located, unless another location is mutually agreed upon. Agreements reached in mediation shall be enforceable as settlement agreements in any court having jurisdiction thereof.

§ 15.4 Arbitration

§ 15.4.1 If the parties have selected arbitration as the method for binding dispute resolution in the Agreement, any Claim subject to, but not resolved by, mediation shall be subject to arbitration which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with its Construction Industry Arbitration Rules in effect on the date of the Agreement. The Arbitration shall be conducted in the place where the Project is located, unless another location is mutually agreed upon. A demand for arbitration shall be made in writing, delivered to the other party to the Contract, and filed with the person or entity administering the arbitration. The party filing a notice of demand for arbitration must assert in the demand all Claims then known to that party on which arbitration is permitted to be demanded.

§ 15.4.1.1 A demand for arbitration shall be made no earlier than concurrently with the filing of a request for mediation, but in no event shall it be made after the date when the institution of legal or equitable proceedings based on the Claim would be barred by the applicable statute of limitations. For statute of limitations purposes, receipt of a written demand for arbitration by the person or entity administering the arbitration shall constitute the institution of legal or equitable proceedings based on the Claim.

§ 15.4.2 The award rendered by the arbitrator or arbitrators shall be final, and judgment may be entered upon it in accordance with applicable law in any court having jurisdiction thereof.

§ 15.4.3 The foregoing agreement to arbitrate and other agreements to arbitrate with an additional person or entity duly

consented to by parties to the Agreement, shall be specifically enforceable under applicable law in any court having jurisdiction thereof.

§ 15.4.4 Consolidation or Joinder

§ 15.4.4.1 Subject to the rules of the American Arbitration Association or other applicable arbitration rules, either party may consolidate an arbitration conducted under this Agreement with any other arbitration to which it is a party provided that (1) the arbitration agreement governing the other arbitration permits consolidation, (2) the arbitrations to be consolidated substantially involve common questions of law or fact, and (3) the arbitrations employ materially similar procedural rules and methods for selecting arbitrator(s).

§ 15.4.4.2 Subject to the rules of the American Arbitration Association or other applicable arbitration rules, either party may include by joinder persons or entities substantially involved in a common question of law or fact whose presence is required if complete relief is to be accorded in arbitration, provided that the party sought to be joined consents in writing to such joinder. Consent to arbitration involving an additional person or entity shall not constitute consent to arbitration of any claim, dispute or other matter in question not described in the written consent.

§ 15.4.4.3 The Owner and Contractor grant to any person or entity made a party to an arbitration conducted under this Section 15.4, whether by joinder or consolidation, the same rights of joinder and consolidation as those of the Owner and Contractor under this Agreement.

SUPPLEMENTARY GENERAL CONDITIONS (To 2017 edition of A201 General Conditions)

01. GENERAL CONDITIONS: The "General Conditions of the Contract for Construction", AIA Document A 201, 2017 edition, as published by the American Institute of Architects, is bound herein, and made a part of the Contract Documents.

02. RELATION OF SUPPLEMENTARY GENERAL CONDITIONS TO GENERAL CONDITIONS: The Supplementary General Conditions hereinafter contain changes and additions to AIA Document A 201, "General Conditions of the Contract for Construction". Where any portion of an Article in AIA Document A 201 is modified or voided by the Supplementary General Conditions, the unaltered provisions shall remain in effect.

03. RELATION TO SUPPLEMENTARY CONDITIONS TO GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION AIA DOCUMENT A 201, 2017 ED.: If there are contradictions between the General Conditions of the Contract for Construction AIA Document A201, 2017 ed." and the "Supplementary General Conditions" the condition most favorable to the Owner shall govern.

04. MODIFICATIONS TO THE GENERAL CONDITIONS: Modify and supplement Articles of AIA Document A 201 as follows:

A. Article 1 - General Provisions:

1. Subparagraph 1.1.1: Add:

"The Contract Documents shall also include the Performance Bond and Payment Bond."

2. Subparagraph 1.1.3: Add:

"1.1.3.1 The word "provide" shall mean furnish and install, complete, in place, and ready for use."

3. Subparagraph 1.1.5: Add:

"Electronic Drawings (.dwg) files will not be provided to the Prime Contractors or Subcontractors."

4. Subparagraph 1.1.6 Add:

"Electronic Specifications (.doc) files will not be provided to the Prime Contractors or Subcontractors."

5. Subparagraph 1.2: Add:

1.2.4 New Paragraph.

"1.2.4 Sections of Division 1 - General Requirements, govern the execution of all sections of the specifications."

1.2.7 New Paragraph.

"1.2.5 Wherever singular numbers or words are used in the Specifications and the Work requires more than one of the terms described, the plural or the word "each" shall be understood and inferred, and as many units as are necessary for a complete installation shall be provided. Similarly, wherever plural words or numbers are used in the Specifications and the Work requires only one of the terms described, the singular shall be understood and inferred, and the one unit for a complete installation shall be provided."

B. Article 2 - Owner: Add the following subparagraph under Paragraph 2.1, "Definition":

"2.1.3 The Owner of this Project is **the Town of Valdese**."

C. Article 3 - Contractor:

1. Subparagraph 3.4: Add:

"3.4.1.1 Unless specified otherwise, workmanship shall be of a grade accepted as the best practice of the particular trade involved. Also, except as exceeded or qualified by the Specifications, workmanship shall be as stipulated in written standards of recognized organizations or institutes of the respective trades."

"3.4.4 Contractor shall submit a complete list of materials, equipment, suppliers and Subcontractors, proposed for the Project. Issuance of the second Certificate for Payment may be withheld until substantial portions of these lists have been submitted."

"3.4.5 Any work necessary to be performed after regular working hours, on Sundays or Legal Holidays, shall be performed without additional expense to Owner."

"3.4.6 At any time during the construction and completion of the work covered by these Specifications, if the conduct of any employee of the Contractor be adjudged inappropriate and a nuisance to the Owner or Architect, or if any employee of the Contractor be considered incompetent or detrimental to the work, the Contractor shall order such parties removed immediately from the grounds."

2. Subparagraph 3.6: Add:

"3.6.1 See Instructions to Bidders for requirements regarding taxes."

3. Paragraph 3.12.4: Add:

"3.12.4.1 The Contractor shall submit a "Schedule of Shop Drawings and Sample Submittals" to the Architect for approval within 30 calendar days from date of award of the Contract. All shop drawings and sample submittals shall be submitted within 3 months after award of Contract."

"3.12.4.2 The schedule shall list submittals and dates for submittals in the same order that the products will be required in the sequence of construction."

"3.12.4.3 Shop drawings shall be dated and contain: name of Project; description or names of equipment, materials and items; and complete identification of locations at which materials or equipment are to be installed; reference to the Section of Specifications where it is specified, and Drawing Number where shown."

"3.12.4.4 Submission of shop drawings shall be accompanied by transmittal letters, containing Project name, Contractor's name, number of drawings, titles, and other pertinent data."

"3.12.4.5 Shop Drawings shall be reviewed and stamped by the Contractor and dated and signed or initialed by the person reviewing the shop drawings. By forwarding the shop drawing to the Architect for review, the Contractor signifies that the shop drawing is approved by the Contractor, that the item is suitable for installation into the Project, and that the item complies with the Drawings and Specifications."

"3.12.4.6 For standard manufactured items not requiring special shop drawings for manufacture (except where required otherwise elsewhere in the Contract Documents), submit 6 copies of manufacturer's catalog sheets showing illustrated cuts of item to be furnished, scale details, sizes, dimensions, performance characteristics, capacities, wiring diagrams and controls, and all other pertinent information. Submittal shall denote the date pertinent to the specific item. Three copies of approved and/or disapproved submissions will be returned to Contractor."

"3.12.4.7 For shop drawings prepared by the Contractor or his Subcontractors or suppliers, submit legible, unfolded, reproducible Drawings. Each Drawing shall have a clear space for stamps. When phrase "by others" appears on shop drawings, General Contractor shall indicate on Drawing who is to furnish material or operations so marked before submittals. When shop drawings are checked "resubmit", or words of like meaning, Contractor shall correct original tracing and submit a new transparency for approval. After completion of checking of each submission of shop drawing transparencies, Architect will obtain prints of each transparency for their records and will then return checked transparencies to General Contractor. For use of all trades, General Contractor shall provide such number of prints as are required for field distribution."

"3.12.4.8 At completion of construction, furnish Owner with 1 unused corrected copy of all shop drawings, manufacturer's diagrams, literature, etc."

"3.12.4.9 Final decisions regarding numbers of shop drawings and their distribution will be made at the preconstruction conference."

D. Article 4 - Administration of the Contract:

1. Paragraph 4.1: Add:

"4.1.1 The terms "Construction Observer", "Project Representative", or other words of same meaning, shall mean a person authorized to perform the duties of and carry out the responsibilities of the Architect at the site."

E. Article 5 - Subcontractors:

1. Paragraph 5.1: Add:

"5.1.3 The Owner or Architect will not undertake to settle any differences between the Contractor and his Subcontractors, nor between Subcontractors."

F. Article 7 - Changes in the Work:

1. Subparagraph 7.1: Add:

"7.1.4 For any deletion or change which results in a net decrease in cost, the credit to be allowed by the Contractor to the Owner shall include a maximum of 10% of the estimated cost of the work for profit, but no allowance for overhead."

"7.1.5 The Contractor's allowance for overhead and profit shall not exceed 15% of the estimated cost of the work. These charges shall include supervision, overhead, bond, profit, general conditions and duration related expenses, and all other expenses associated with the work."

G. Article 9 - Payments and Completion:

1. Subparagraph 9.3.1: Add:

"9.3.1.3 The Contractor's Application for Payment shall be made on AIA Form G 702. The certification included thereon shall be executed and notarized."

2. Subparagraph 9.3.2: Add:

"9.3.2.1 If there is inadequate storage space on the site, and if the Contractor desires to include in his Application for Payment any materials stored in a bonded warehouse or the supplier's warehouse, he shall assign such materials to the Owner. If the Architect determines that they are properly stored and protected against damage or theft, he will approve payment for such materials. All stored materials shall be insured in the name of the Owner in an amount equal to the purchase price of the material with a company licensed to do business in the State of North Carolina."

"9.3.2.2 Material stored off-site and included in the Contractor's Application for Payment shall be stored together in one location and shall be arranged such that the Architect can reasonably conduct an inventory of the material. The Architect will not certify payment for material that is stored such that the Architect cannot conduct a reasonable inventory. Stored materials included in the Contractor's Application for Payment must be stored in a location approved in advance by the Owner."

3. Paragraph 9.3: Add:

"9.3.4 Unless otherwise stated in the Agreement or Contract, Progress Payments will be made monthly on the basis of 95% of the work done, plus 95% of materials stored or stockpiled in an approved manner and location."

4. Add paragraph 9.11 (this was in 2007 version and not included by Clark on Surry County – I suggest that it be added – MCL)

"9.11 FINAL INSPECTION AND ACCEPTANCE: Prior to the final inspection, and at the written request of the Contractor, the Architect will conduct ONE pre-final inspection. The Architect will prepare a list (punch list) of items that are found to be incomplete or not in accordance with the Contract Documents, which shall be completed by the Contractor prior to the final inspection. Upon completion of the punch list items, the Contractor shall make a written request for a final inspection. The Architect will conduct ONE final inspection, including inspection of the punch list items. If the Architect determines that all punch list items have not been corrected by the Contractor or that other work does not conform to the Contract Documents, which causes an additional final inspection to be necessary, the Contractor will be required to pay the Owner for the Architect's expenses for re-inspection and the Owner will reimburse the Architect. For this Project, the Architect's re-inspection fee shall be $300.00 per re-inspection."

H. Article 11 - Insurance and Bonds:

1. Paragraph 11.1.2: Add:

"11.1.2.1 Prior to signing the Contract, the Contractor shall furnish Performance and Payment Bonds covering the faithful performance of the Contract and the payment of all obligations arising thereunder. Cost of bonds shall be paid by the Contractor. Such bonds shall be written by a company or companies lawfully authorized to do business in North Carolina having a rating of B+ or above by A.M. Best Company or having been approved by the Owner. The Contractor shall furnish

bonds satisfactory to the Owner covering faithful performance of the contract and payment of obligations arising thereunder as required by law. Bonds may be obtained, through the Contractor's usual source and the cost thereof shall be included in the contract sum. The amount of each bond shall be equal to 100 percent of the contract sum."

"11.1.2.2 The Contractor shall deliver the bonds to the Owner, not later than the date of execution of the Contract; or if the work is commenced prior thereto in response to a Notice to Proceed, or letter of intent, the Contractor shall, prior to commencement of the work, submit evidence satisfactory to the Owner that such bonds will be issued."

"11.1.2.3 Bonds shall be executed on the forms included in the "Contract Forms" part of the Project Manual, Performance Bond and Payment Bond, with amount shown on each part equal to 100% of the total amount payable by terms of the Contract. Surety shall be a company licensed to do business in the State of North Carolina and shall be acceptable to the Owner. Title "Licensed Resident Agent" shall appear after signature."

"11.1.2.4 Bonds shall be dated the same as or subsequent to the Contract and shall be accompanied by a current certified Power-of-Attorney. Bonds shall be furnished in sufficient numbers so that one original can be bound with each original of the Agreement."

"11.1.2.5 Seal of bonding company shall be impressed on each original of bond."

"11.1.2.6 Contractor's signature(s) on Performance Bond and Payment Bond shall correspond to that of the Contract, such person signing the Agreement involved under laws of the State of North Carolina."

"11.1.2.7 In the event of change orders or other contract modifications that increase the Contractor's scope of work or responsibility, the Contractor shall ensure that the increased cost of bonds is included in his change order price such that the bonds are kept valid and in effect without interruption and cover the Contractor's entire scope of work including modifications. The Contractor shall not allow the bonds to expire or otherwise terminate prior to completion of the Project without 30 days written notice to the Owner with copy to the Architect. "

I. Affirmative Action Policy: If an Affirmative Action Policy for Minority/Women's Business Enterprises are included in the Project Manual, it is included by reference in these Supplementary General Conditions and is an integral part of the Bidding and Contract Documents."

END OF SC

SECTION 01 11 00
SUMMARY OF THE WORK

1.1 LOCATION OF SITE:

Massel Ave SE, Valdese, NC 28690

1.2 SCOPE OF THE WORK:

A. The work described in the Contract Documents includes the furnishing of all labor, materials, equipment, and services necessary for the complete construction of the Project titled

Town of Valdese - Draughn Aquatic Center Structure

All work of this Project shall comply with the International Building Code with North Carolina Amendments.

B. Site Work:

1. See notes on the Site Plan sheet of the Drawings for the description of division of responsibility for grading, curb and gutters, site drainage, and paving related to drives and parking areas.

2. The work includes the complete demolition and removal of all existing structures both above and below grade as required to properly install the new construction.

3. The General Contractor shall comply with applicable provisions of State and local requirements for Soil Erosion Control. The Contractor shall secure necessary approval for compliance with necessary ordinances for the construction process.

C. Permits:

1. The Contractor shall obtain and pay for all necessary permits.

D. Testing:

1. The Owner will employ an independent testing laboratory for testing required by these Specifications. The Contractor shall notify the testing laboratory a minimum of 24 hours in advance of performing work requiring specified testing.

2. If proper notice is not given to the testing laboratory prior to beginning work, the Contractor shall cease such work until the laboratory can properly staff the Project.

3. If the testing laboratory, after having been given the proper 24-hour notice, fails to arrive at the site at the scheduled time, the Contractor shall immediately contact the Architect for further instructions. Do not begin work to be tested prior to discussing the absence of the testing lab with the Architect.

1.3 SINGLE PRIME CONTRACT:

A. The Owner will execute a single agreement with the successful General Contractor Bidder only and his work will include general construction, plumbing, HVAC, electrical, and all other work required by the Contract Documents.

END OF SECTION

SECTION 01 12 00
OWNER OCCUPANCY DURING CONSTRUCTION

1.1 OWNER OCCUPANCY DURING CONSTRUCTION:

A. The Owner will occupy the existing building while the new addition is being constructed and will occupy the area being renovated while that work is being done.

B. The Contractor is to coordinate with the Owner and provide temporary protection and incorporate work procedures and schedules as required to minimize disruption to the Owner such that his normal activities can continue without interruption.

C. See Section 02 22 10 Selective Demolition. Requirements included in that Section regarding Owner occupancy during construction shall be applicable to new construction as well as selective demolition.

END OF SECTION

SECTION 01 20 00
ALLOWANCES & UNIT PRICES

1.1 RELATED DOCUMENTS:

A. Drawings and general provisions of the Contract, including General and Supplementary General Conditions and other Division 1 Specifications, apply to this Section.

1.2 SUMMARY:

A. This Section includes administrative and procedural requirements governing allowances and unit prices.

1.3 ALLOWANCES:

A. Definition: An allowance is a predetermined sum of money set aside within the project budget to be used for specific items not yet fully defined in the bid documents.

B. The Contractor shall include in the base bid all Allowances listed below.

C. Allowances: (Note that the word provide shall mean to furnish and install.)

1. Allowance No. 1: 50 CY of excavation and off-site removal of unsuitable soil and replacement of off-site backfill (57 stone) compacted.

1.4 UNIT PRICES:

A. Definition: A Unit Price is an amount proposed by bidders, stated on the Bid Form, as a price per unit of measurements for materials or services added to or deducted from the Contract Sum by appropriate modification, if the quantities of Work required by the Contract Documents are increased or decreased.

B. Unit prices include all necessary material, plus the cost for delivery, installation, insurance, overhead, profit, applicable taxes, and all other expenses associated with the work.

C. Unit Prices Schedule: The required unit prices listed below are also listed on the Bid Form. The unit prices will be used to adjust the Contract Sum if less than or more than the specified or indicated quantity is required to complete the work required by the Contract Documents

Excavation and Off-Site Removal of Unsuitable Soil
and Replacement with Off-Site Backfill
(57 Stone) Compacted $_____ per Cu. Yd.

END OF SECTION

SECTION 01 31 00
PROJECT MEETINGS

1.1 RELATED DOCUMENTS:

A. Drawings and general provisions on the Contract, including General and Supplementary General Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY:

A. This Section specifies administrative and procedural requirements for project meetings, including but not limited to, the following:

- Preconstruction Conference
- Preinstallation Meetings
- Project Construction Meetings

1.3 PRECONSTRUCTION CONFERENCE:

A. Shortly after the notification of an award for the construction of this Project, the Owner will schedule a Preconstruction Conference. This conference shall be attended by representatives of the Successful Contractor and major subcontractors.

B. The Architect and his Consultants will be represented at this meeting along with the Owner's and Architect's field representatives.

C. The purpose of this meeting will be to introduce the various personnel to be involved in the construction and to review the various scheduling and Project requirements.

D. The General Contractor shall present a Contractor’s Construction Schedule for the entire Project including all major phases of construction for review by the Architect and Owner during this meeting. Refer to Section 01 33 00 - Submittals, for additional requirements for the Contractor’s Construction Schedule.

E. The General Contractor shall submit a list of dates anticipated for the installation of "Owner-Furnished/Contractor-Installed" materials and equipment (see Section 01 11 00), as part of the Contractor’s Construction Schedule.

1.4 PREINSTALLATION MEETINGS:

A. Preinstallation meetings will be required for all major components of the Project, including, but not limited to, concrete, masonry, windows, curtainwall, roofing, and finishes. The Contractor is to schedule meetings. Minutes are to be kept by the Contractor and distributed to all parties concerned. Architect and Engineer will be present. See individual specification sections for additional requirements.

B. Do not proceed with the installation if the meeting cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to the performance of Work and reconvene the meeting at the earliest feasible date.

1.5 PROJECT CONSTRUCTION MEETINGS:

A. During the course of construction, the Contractor shall schedule weekly meetings, to be handled by the Contractor, to review the progress of the Project. (These meetings may be waived in the early phases of construction if the Architect agrees that such a meeting is not necessary). Minutes shall be kept by the Contractor and distributed to all parties concerned.

B. At least monthly, one of these weekly meetings shall be attended by the General Contractor's Project Manager. A representative of the Owner and a representative of the Architect will be present.

C. The purpose of these meetings will be to review the progress of the project, problems, and decisions required (and by whom).

D. Contractor's Construction Schedule: Review progress since the last meeting. Determine where each activity is in relation to the Contractor's Construction Schedule, whether on time or ahead or behind schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time. Update Contractor's Construction Schedule as necessary to keep the current status of the Project available to the Owner and the Architect. Distribute updates to all parties concerned.

END OF SECTION

SECTION 01 33 00
SUBMITTALS

1.1 RELATED DOCUMENTS:

A. Drawings and general provisions of Contract, including General and Supplementary General Conditions and other Division 1 Specifications Sections, apply to work of this Section.

1.2 SUMMARY:

A. This Section includes administrative and procedural requirements for submittals required for the performance of the Work, including but not limited to, the following:

- Contractor's construction schedule
- Submittal schedule
- Daily construction reports
- Shop drawings
- Product data
- Samples
- Quality assurance submittals
- Schedule of values
- Request for information (RFI)
- Electronic Submittals

B. Administrative Submittals: Refer to other Division 1 Section and General and Supplementary General Conditions and other Contract Documents for requirements for administrative submittals. Such submittals include, but are not limited to, the following;

- Permits
- Application for payment
- Performance and payment bonds
- Insurance certificates
- List of subcontractors

1.3 SUBMITTAL PROCEDURES:

A. Coordination: Coordinate preparation and processing of submittals with the performance of construction activities. Transmit each submittal sufficiently in advance of the performance of related construction activities to avoid delay.

B. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.

C. Coordinate transmittal of different types of submittals for related elements of the Work so processing will not be delayed by the need to review submittals concurrently for coordination.

1. Architect reserves the right to withhold action on a submittal requiring coordination with other submittals until all related submittals are received.

D. Processing: To avoid the need to delay installation because of the time required to process submittals, allow sufficient time for submittal review, including time for resubmittals.

1. No extension of Contract Time will be authorized because of the failure to transmit submittals to the Architect sufficiently in advance of the Work to permit processing.

E. Submittal Transmittal: Package each submittal appropriately for transmittal and handling. Transmit each submittal from the Contractor to the Architect using a transmittal form. The Architect will not accept submittals received from sources other than the Contractor.

1.4 CONTRACTOR'S CONSTRUCTION SCHEDULE:

A. Bar-Chart Schedule: Prepare a fully developed, horizontal bar-chart-type, Contractor's Construction Schedule. Submit within 30 days after the date established for "Commencement of Work."

B. Provide two bars for each significant construction activity. One is the schedule bar and immediately below it is the actual progress bar. The Contractor's Construction Schedule must be signed by the Contractor and submitted no later than the second payment request.

C. Coordinate the Contractor's Construction Schedule with the Schedule of Values, list of subcontracts, Submittal Schedule, progress reports, payment requests, and other schedules.

D. Revise the schedule after each meeting, event, or activity where revisions have been recognized or made. Issue the updated schedule concurrently with the report of each meeting.

1.5 SCHEDULE OF SUBMITTALS:

A. The Contractor shall prepare and submit to Architect a schedule of shop drawings, product data, samples, and other submittals as required in the General and Supplementary General Conditions and the Contract Documents. The schedule shall fix dates for submission and the lead-time for each submittal as related to the requirement for return-receipt of submittal to expedite delivery of material to maintain Contractor's Construction Schedule.

B. It is to be understood that this schedule will be subject to change from time to time in accordance with the progress of the work. Revise the schedule after each meeting or activity where revisions have been recognized or made. Issue the updated schedule concurrently with the report of each meeting.

C. No work shall be performed on work involving submittals until the Architect's written approval has been received.

1.6 DAILY CONSTRUCTION REPORTS:

A. Prepare a daily construction report, including but not limited to, the following information concerning events at the site, and submit duplicate copies to the Architect at weekly intervals.

- List of subcontractors at the site
- An approximate count of personnel at the site
- High and low temperatures, general weather conditions
- Meetings and significant decisions
- Stoppages, delays, shortages, and losses
- Orders and requests of governing authorities
- Change orders received, implemented
- Services connected, disconnected
- Equipment or systems tests and startups

1.7 SHOP DRAWINGS:

A. Electronic Drawings (.dwg) and Specifications (.doc) files will not be provided to the Contractor or subcontractors for purposes of preparing shop drawings.

B. Submit newly prepared information drawn accurately to scale. Highlight, encircle, or otherwise indicate deviations from the Contract Documents. Do not reproduce Contract Documents or copy standard information as the basis of Shop Drawings. Standard information prepared without specific reference to the Project is not a Shop Drawing.

C. Shop drawing includes fabrication and installation Drawings, setting, diagrams, schedules, patterns, templates and similar Drawings.

1.8 PRODUCT DATA:

A. Collect product data into a single submittal for each element of construction or system. Mark each copy to show applicable choices and options. Where printed product data includes information on several products that are not required, mark copies to indicate applicable information. Product data should include, but is not limited to, the following information:

- Manufacturer's printed recommendations
- Compliance with trade association standards
- Compliance with recognized testing agency standards
- Application of testing agency labels and seals
- Notation of dimensions verified by field measurements (when applicable)

1.9 SAMPLES:

A. Submit samples for review of size, kind, color, pattern, and texture. Submit samples for a final check of these characteristics with other elements and a comparison of these characteristics between the final submittal and the actual component installed.

B. Refer to other Specification Sections for requirements for samples that illustrate workmanship, fabrication techniques, details of assembly, connections, operation, and similar construction characteristics.

1.10 QUALITY ASSURANCE SUBMITTALS:

A. Submit quality -control submittals, including design data, certifications, manufacturer's instructions, manufacturer's field reports, test reports, and other quality-control submittals as required under this Section and as required in other Sections of these Specifications.

1.11 SCHEDULE OF VALUES:

A. The Schedule of Values required by the General and Supplementary General Conditions shall be divided into the sixteen divisions included in the Specifications and itemized in sufficient detail such that the Architect can fairly evaluate the subsequent payment requests submitted by the Contractor.

1.12 REQUEST FOR INFORMATION (RFI):

A. In the event that the Contractor discovers what he considers to be a contradiction in the Contract Documents, or feels that he requires more information than is provided by the Contract Documents, or needs clarification or an interpretation of information included in the Contract Documents, he shall submit a Request For Information (RFI) to the Architect clearly describing the information that is required and clearly referencing the specific documents and locations in the documents involved.

B. Responses from the Architect to RFI's will not change any requirements of the Contract Documents. In the event the Contractor believes that a response to an RFI will cause a change in the requirements of the Contract Documents, the Contractor shall immediately give written notice to the Architect, stating that the Contractor considers the response to be a Change Order. Failure to give such written notice shall waive the Contractor's right to seek additional time or cost related to the RFI.

C. All RFI's shall be on a printed form approved by the Architect. The form shall state the contractor's name, date, project name, RFI number, brief subject description, specification reference (section & page), drawing reference (sheet & detail number), room number (if applicable), and request narrative. The contractor shall sign and date each request. The form shall have sufficient space for a written reply by the Architect.

D. All RFI's shall be numbered sequentially from beginning to completion of the Project.

1.13 ELECTRONIC SUBMITTALS:

A. RFI Submittals: RFI file name must be the RFI number_ job number (i.e. RFI-001_24-858) and must contain the following:

- Project name
- Date.
- Submittal purpose and description.
- Specification paragraph number or drawing designation.

B. Shop Drawing Submittals: Shop Drawing file name must be named as follows;

Section#-Submittal#-Revision#_FileName_Job#
Ex: 076200-02-00_Samples_24-858.pdf

and must contain the following:

- Project name
- Date
- Specification Section number and title.
- Contractor's stamp and review comments on the shop drawing itself.
- Indication of full or partial submittal.

1.15 NUMBER OF COPIES REQUIRED FOR SUBMITTALS:

A. The number of copies of submittals shall be generally as described below, except where otherwise noted in these Specifications. However, all final decisions regarding this issue will be made at the Preconstruction Conference.

B. Type of Submittal:

1. Contractor's Construction Schedule:	Submit (1) PDF.
2. Schedule of Submittals:	Submit (1) PDF.
3. Daily Construction report:	Submit (1) PDF.
4. Shop Drawings:	Submit (1) PDF.
5. Product Data:	Submit (1) PDF.
6. Samples:	Submit samples in duplicate until approval is secured, and then submit 2 additional equivalent samples for Architect's use.
7. Quality Assurance Submittals:	as required by other Sections of the Specifications.

8. Schedule of Values:	Submit in duplicate.
9. Electronic Submittal	1 PDF.

1.16 OTHER SUBMITTALS:

A. Comply with submittal requirements specified in this Section and in other sections and parts of the Project Manual.

1.17 UNSOLICITED SUBMITTALS:

A. The Architect will return unsolicited submittals to the sender without action.

END OF SECTION

SECTION 01 35 50
PRODUCT REQUIREMENTS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. General product requirements.

PART 2 PRODUCTS

2.1 PRODUCTS

A. Provide new products unless specifically required or permitted by the Contract Documents.

B. Do not use products having any of the following characteristics:

1. Made outside the United States, its territories, Canada, or Mexico.

2. Made using or containing CFC's or HCFC's.

3. Made of wood from newly cut old-growth timber.

C. Where all other criteria are met, Contractor shall give preference to products that:

1. Are extracted, harvested, and/or manufactured closer to the location of the project.

2. Have a longer documented life span under normal use.

3. Result in less construction waste.

D. Regionally Sourced Products:

1. Overall Project Requirement: Provide materials amounting to a minimum of 20 percent of the total value of all materials (excluding plumbing, HVAC, electrical, elevators, and other equipment) that have been extracted, harvested, or recovered, as well as manufactured, within a radius of 500 miles from the project site.

E. Products with Recycled Content:

1. Overall Project Requirement: Provide products with recycled content such that the sum of post-consumer recycled content plus one-half of the post-industrial recycled content constitutes at least 20 percent of the total value of all products installed, except mechanical and electrical components.

2. Calculations: Determine percentage of post-consumer and post-industrial content separately.

a. Previously used, reused, refurbished, and salvaged products are not considered recycled.

b. Wood fabricated from timber abandoned in transit to the original mill is considered reused, not recycled.

c. Determine the percentage of recycled content of any item by dividing the weight of recycled content in the item by the total weight of all material in the item.

d. Determine the value of recycled content of each item separately, by

multiplying the content percentage by the value of the item.

F. Sustainably Harvested Wood:

1. Definition: Wood-based materials include but are not limited to structural framing, dimension lumber, flooring, wood doors, finishes, and furnishings that are permanently installed in the project. Wood and wood-based products not permanently installed in the project are not included in the definition.

2. Overall Project Requirement: Provide a minimum of 50 percent of all wood-based materials made of sustainably harvested wood.

4. Certification: Provide wood certified or labeled by an organization accredited by The Forest Stewardship Council.

G. Urea-Formaldehyde Prohibition:

1. Overall Project Requirement: Provide composite wood and agrifiber products having no added urea-formaldehyde resins.

a. Require each installer to certify compliance and submit product data showing product content.

H. Flooring Systems:

1. Flooring elements installed in the interior of the building must meet the testing and product requirements of CAL (VOC).

a. Require each installer to certify compliance and submit product data showing product content.

I. Adhesives and Joint Sealants:

1. Definition: This provision applies to gunnable, trowelable, and liquid-applied adhesives, sealants, and sealant primers used anywhere on the interior of the building inside the weather barrier, including duct sealers.

2. Provide only products having lower volatile organic compound (VOC) content then required by South Coast Air Quality Management District Rule No.1168.

a. Require each installer to certify compliance and submit product data showing product content.

J. Aerosol Adhesives:

1. Provide only products having a lower volatile organic compound (VOC) content than required by GreenSeal GS-36.

a. Require each installer to certify compliance and submit product data showing product content.

K. Paints and Coatings - Volatile Organic Compound (VOC) Content:

1. Provide paints, coatings, and primers applied to interior walls and ceilings that do not exceed the VOC limitations established in Green Seal Standard GS-11:

a. Flats: 50 g/L, maximum.

b. Nonflats: 150 g/L, maximum.

3. Provide anti-corrosive and anti-rust paints applied to interior ferrous metal substrates that do not exceed the VOC limitations established by Green Seal Standard GC-03:

a. Opaque, High Gloss: 150 g/L, maximum.

4. Provide clear wood finishes, floor coatings, stains, and shellacs applied to interior elements that do not exceed the VOC limitations established in South Coast Air Quality Management District (SCAQMD) Rule No. 1113:

a. Clear Wood Finishes: Varnish: 350 g/L, maximum, Lacquer: 550 g/L, maximum.

b. Floor Coatings: 100 g/L, maximum.

c. Shellacs: Clear: 730 g/L, maximum, Pigmented: 550 g/L, maximum.

d. Sealers: Waterproofing Sealers: 250 g/L, maximum, Sanding Sealers: 275 g/L, maximum; All Other Sealers: 200 g/L, maximum.

e. Stains: 250 g/L, maximum.

5. Comply with architectural coatings VOC limits of the State of North Carolina, if more stringent than requirements specified above.

6. Determination of VOC Content: Testing and calculation in accordance with 40 CFR 59, Subpart D (EPA Method 24), exclusive of colorants added to a tint base and water added at project site; or other method acceptable to authorities having jurisdiction.

L. VOC Limits Throughout:

1. Wood Glues: 30 g/L.
2. Metal to Metal Adhesives: 30 g/L.
3. Adhesives for Porous Materials (Except Wood): 50 g/L.
4. Subfloor Adhesives: 50 g/L.
5. Plastic Foam Adhesives: 50 g/L.
6. Carpet Adhesives: 50 g/L.
7. Carpet Pad Adhesives: 50 g/L.
8. VCT and Asphalt Tile Adhesives: 50 g/L.
9. Cove Base Adhesives: 50 g/L.
10. Gypsum Board and Panel Adhesives: 50 g/L.
11. Rubber Floor Adhesives: 60 g/L.
12. Ceramic Tile Adhesives: 65 g/L.
13. Multipurpose Construction Adhesives: 70 g/L.
14. Fiberglass Adhesives: 80 g/L.
15. Contact Adhesive: 80 g/L.
16. Structural Glazing Adhesives: 100 g/L.
17. Wood Flooring Adhesive: 100 g/L.
18. Structural Wood Member Adhesive: 140 g/L.
19. Special Purpose Contact Adhesive (contact adhesive that is used to bond melamine covered board, metal, unsupported vinyl, Teflon, ultra-high molecular weight polyethylene, rubber, or wood veneer 1/16 inch or less in thickness to any surface): 250 g/L.
20. Top and Trim Adhesive: 250 g/L.
21. Plastic Cement Welding Compounds: 250 g/L.
22. ABS Welding Compounds: 325 g/L.
23. CPVC Welding Compounds: 490 g/L.
24. PVC Welding Compounds: 510 g/L.
25. Adhesive Primer for Plastic: 550 g/L.
26. Sheet Applied Rubber Lining Adhesive: 850 g/L.
27. Aerosol Adhesive, General Purpose Mist Spray: 65 percent by weight.
28. Aerosol Adhesive, General Purpose Web Spray: 55 percent by weight.
29. Special Purpose Aerosol Adhesive (All Types): 70 percent by weight.
30. Other Adhesives: 250 g/L.

31. Architectural Sealants: 250 g/L.
32. Nonmembrane Roof Sealants: 300 g/L.
33. Single-Ply Roof Membrane Sealants: 450 g/L.
34. Other Sealants: 420 g/L.
35. Sealant Primers for Nonporous Substrates: 250 g/L.
36. Sealant Primers for Porous Substrates: 775 g/L.
37. Modified Bituminous Sealant Primers: 500 g/L.
38. Other Sealant Primers: 750 g/L.

39. Flat Paints, Coatings, and Primers: VOC not more than 50 g/L.
40. Nonflat Paints, Coatings, and Primers: VOC not more than 50 g/L.
41. Anticorrosive and Antirust Paint Applied to Ferrous Metals: VOC not more than 100 g/L.
42. Clear Wood Finishes, Varnishes: VOC not more than 275 g/L.
43. Clear Wood Finishes, Lacquers: VOC not more than 275 g/L.
44. Floor Coatings: VOC not more than 50 g/L.
45. Shellacs, Clear: VOC not more than 730 g/L.
46. Shellacs, Pigmented: VOC not more than 550 g/L.
47. Stains: VOC not more than 100 g/L.

2.2 PRODUCT OPTIONS

A. Products Specified by Reference Standards or by Description Only: Use any product meeting those standards or description.

B. Products Specified by Naming One or More Manufacturers: Use a product of one of the manufacturers named and meeting specifications, no options or substitutions allowed.

PART 3 EXECUTION

3.1 OWNER-SUPPLIED PRODUCTS

A. See Section 01 11 00 - Summary for identification of Owner-supplied products.

B. Owner's Responsibilities:

1. Arrange and pay for product delivery to the site.

2. Submit claims for transportation damage and replace damaged, defective, or deficient items.

C. Contractor's Responsibilities:

1. Receive and unload products at the site; inspect for completeness or damage port any damage to Owner.

2. Handle, store, install, and finish products.

3. Provide installation inspections where required by the manufacturer.

4. Repair or replace items damaged after receipt.

END OF SECTION

SECTION 01 42 00
REFERENCE STANDARDS & LAYOUT WORK

1.1 REFERENCE TO INDUSTRY STANDARDS:

A. Whenever reference is made to codes, standard specifications, or other data published by regulating agencies or accepted organizations, it shall be understood that such reference is made to the latest edition (including addenda) published prior to the date of the Contract Documents, except as noted specifically otherwise by date in the Contract Documents.

B. Requirements included in referenced standards are included in the Contract Documents by reference thereto and are an integral part of the Contract Documents as much so as if included verbatim.

C. Among those frequently used in the Contract Documents are the following (with the respective abbreviations used):

- American Society for Testing and Materials (ASTM)
- U. S. Department of Commerce
- Commercial Standards (CS)
- Product Standards (PS)
- Federal Specifications (FS)
- American National Standards Institute (ANSI)
- National Electric Code (NEC)
- North Carolina State Building Code (Code)
- Underwriter's Laboratories Inc. (UL)
- Architectural Woodwork Institute (AWI)
- American Architectural Manufacturer's Association (AAMA)
- American Concrete Institute (ACI)
- American Iron and Steel Institute (AISI)
- American Welding Society (AWS)
- Prestressed Concrete Institute (PCI)
- Steel Joist Institute (SJI)
- Steel Deck Institute (SDI)

1.2 LAYOUT WORK:

A. Lines and Levels: The Owner will establish lot lines, restrictions, and a benchmark. General Contractor shall establish benchmarks in not less than 2 widely separated places. As work progresses, General Contractor shall establish benchmarks at each floor level, giving exact levels of various floors. As work progresses, General Contractor shall lay out exact location of all partitions as a guide to all trades. All other grades, lines, levels, and benchmarks shall be established and maintained by the Contract requiring them, and they shall be responsible for same.

B. Construction Tolerances:

1. Variation from Plumb: For vertical lines and surfaces of columns, walls and arises do not exceed 1/4" in 10', or 3/8" in a story height not to exceed 20', nor 1/2" in 40' or more. For external corners, expansion joints, control joints, and other conspicuous lines do not exceed 1/4" in any story or 20' maximum, nor 1/2" in 40' or more.

2. Variation from Level: For bed joints and lines of exposed lintels, sills, parapets, horizontal grooves, and other horizontal lines, do not exceed 1/4" in any bay of 20' maximum, nor 1/2" in 40' or more. For top surface of bearing walls do not exceed 1/8" between adjacent floor elements in 10' of 1/16" within width of a single unit.

3. Variation of Linear Building Line: For position shown in plan and related portion of columns, walls, and partitions, do not exceed 1/2" in any bay of 20' maximum, nor 3/4" in 40' or more.

4. Variation in Cross-Sectional Dimensions: For columns and thickness of walls, from dimensions shown, do not exceed minus 1/4" nor plus 1/2".

END OF SECTION

SECTION 01 50 00
TEMPORARY FACILITIES

1.1 RELATED DOCUMENTS:

A. Drawings and general provisions of the Contract, including General and Supplementary General Conditions and other Division 1 Specifications Sections, apply to this Section.

1.2 SUMMARY:

A. This section includes requirements for temporary facilities, including temporary utilities, support facilities, and security and protection.

1.3 DEFINITION:

A. Where the word "Contractor" is used in this Section, reference is to each Prime Contractor who has a direct contract with the Owner. Where "General Contractor" is used, reference is to the General Contractor only.

1.4 TEMPORARY UTILITIES:

A. Water Service: The General Contractor shall make the necessary arrangements and provide all water service and distribution piping of sizes and pressures adequate for the entire construction period.

B. Electric Power Service: The General Contractor shall make the necessary arrangements and provide all temporary electric service and lighting required by all trades during the entire construction period. The metered cost of electricity used shall be borne by the General Contractor.

C. Weather Protection, Temporary Heat, Ventilation, and Air Conditioning:

1. Extent: The General Contractor shall provide all-weather protection, temporary heat or cooling and fuel as necessary to carry on the work expeditiously during inclement weather, to protect all work and materials against injury from dampness and cold, to dry out the building and to provide suitable working conditions for the installation and curing of materials until final acceptance by the Owner. Unless otherwise required in the various Specification Sections, building interiors shall be maintained between 45° F. and 85° F. during installation of interior finish work.

2. Methods: The methods of heating or cooling and the type of fuel and equipment used shall be subject to approval by the Architect. After the building is completely enclosed, the General Contractor may utilize the permanent mechanical equipment with the qualifications herein stipulated; he shall, however, supply any additional equipment required. Any permanent equipment so used shall be turned over to the Owner in the condition and at the time required by the Specifications. The General Contractor's use of permanent equipment is hereby qualified as follows:

a. Permanent Equipment: The permanent equipment shall not be used for temporary heat or cooling unless and until all safety devices specified or required for the safe operation of the equipment are installed and operating properly.

b. Cost: The General Contractor shall pay all power and fuel costs required by the use of the permanent heating and cooling equipment. However, the HVAC Contractor shall be responsible for the readiness and maintenance of the equipment during the period that it is used after the building is enclosed.

c. In using permanent equipment, the HVAC Contractor shall provide filters (in addition to filters required with equipment) at all points where air enters the system. Maintain such filters until the building is occupied. Failure to do so will result in the Owner employing an independent cleaning company to vacuum all supply and return ductwork and to clean all cooling and heating equipment. The cost of such a cleaning operation will be charged to the HVAC Contractor at no cost to the Owner.

d. In the event that the Contractor does use mechanical equipment provided under the Contract for heating and cooling purposes during the construction period, **the Contractor will still be required to provide the guarantees specified in Division 23 - Mechanical or shown on Mechanical Drawings, for the length of time specified and with the time beginning at substantial completion of the facility.**

E. Temporary Toilet Facilities:

1. General Contractor shall provide and maintain an adequate number of temporary toilets with proper enclosures as necessary for use of all trades during construction. The location of the toilets shall be subject to approval of the Architect. Keep toilets clean and comply with all local and state health requirements and sanitary regulations.

2. Toilet facilities shall be the prefabricated chemical type. Remove temporary toilets at the completion of the work.

3. The toilet facilities in the buildings under construction or other existing buildings of the Owner shall not be used by the Contractor's personnel at any time.

1.5 SUPPORT FACILITIES:

A. Contractor's Temporary Field Office: General Contractor shall provide and maintain a suitable temporary field office at the Project Site for his own use and available to the Owner and Architect during normal working hours.

1. The office shall be painted, heated during cold weather, and provided with movable windows, doors, locks, and adequate lighting to facilitate reading of the documents and other paperwork and other functions normally required in a field office. Provide layout tables, chairs, drawing racks and other furniture and equipment normally required for this purpose.

2. Other Prime Contractors having a Contract with the Owner shall provide their own office or shall make arrangements with the General Contractor to provide office space for them.

3. The location of the temporary office shall be subject to approval by the Architect.

B. Temporary Sheds: The Contractor shall provide and maintain additional storage sheds and other temporary buildings, or trailers as required for proper storage of materials on the site. The location of sheds and trailers shall be subject to the approval of the Architect. Remove sheds when work is completed.

C. Project Sign: General Contractor shall furnish, erect and maintain a Project sign fabricated from preservative-treated lumber and exterior grade, 3/4" thick fir plywood, and as detailed on the Drawings.

1. The sign shall be mounted securely and rigidly on pressure-treated posts and shall be located where directed by the Architect.

2. No other signs will be allowed unless specifically approved by the Architect.

E. Temporary Construction Fence: Contractor is to provide a temporary galvanized chain link fence, minimum of 6'-0" height, with all required gates, locks and other components as necessary to isolate the construction area from the Owner's personnel and the general public and to provide security for construction materials and equipment.

1. See Drawings for the general location of the fence.

1.6 PROTECTION: Protection shall consist (in general) of the following:

A. Plant Material: The Contractor shall protect all trees, shrubs, lawns, and all landscape work from damage, providing guards and covering. Any damaged work shall be repaired or replaced at Contractor's expense.

B. Streets and Walks: The Contractor shall protect all existing streets and walks and shall repair any damage during construction at his own expense.

C. Private Roads and Walks: The Contractor shall protect existing private roads and walks. He shall maintain them during course of work and shall repair all damages to same at his own expense.

D. Safety: The Contractor shall be responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the work.

E. Heating Occupied Spaces Prior to Final Acceptance: Should a portion of the building be occupied by the Owner prior to substantial completion, the cost of fuel and operation of the heating system for the occupied portion will be borne by the Owner from time of occupancy until final acceptance.

F. Water Protection: The Contractor shall, at all times, protect excavation and trenches from rainwater, spring water, groundwater, backing-up of drains or sewers, and all other water. He shall provide all pumps and equipment and enclosures to provide this protection.

G. Temporary Drainage: The Contractor shall construct and maintain all necessary temporary drainage and shall do all pumping necessary to keep excavation and low areas free of water.

H. Snow and Ice: The Contractor shall remove all snow and ice as may be required for proper protection and execution of work.

I. Guard Lights: The Contractor shall provide and maintain guard lights at all barricades, obstructions in streets, roads, or sidewalks, and at all trenches or pits adjacent to public walks or roads.

J. Cold Weather: During cold weather, the Contractor shall protect all work against damage. If low temperatures make it impossible to continue operations safely (in spite of cold weather precautions), Contractor shall cease work and shall so notify the Architect. In this event, the Contractor is still responsible for protecting all work in place.

K. Fire: Open fires will not be permitted.

1.7 SITE MAINTENANCE:

A. At the completion of the building pad, the General Contractor will be responsible for maintaining an area fifty (50) feet wide from the outside face of any building. This area is to be maintained so as to provide access to the building by all trades. Maintenance will include but is not limited to, keeping the area graded level, free of rutting and excessive mud

accumulation. The General Contractor is responsible for maintaining this area until time for touch upgrading. At this time, the General Contractor will re-grade the fifty (50) foot perimeter area and all areas disturbed by construction activities. The Contractor will re-spread the topsoil around the building and provide permanent grassing and landscaping.

END OF SECTION

SECTION 01 61 00
MATERIALS AND EQUIPMENT

1.1 RELATED DOCUMENTS:

A. Drawings and general provisions of Contract, including General and Supplementary General Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY:

A. This Section specifies requirements governing the Contractor's selection of products for use in the Project.

B. The Contractor's Construction Schedule and Schedule of Submittals are included under Section 01 33 00 - Submittals.

C. Standards: Refer to Section 01 42 00 - Reference Standards for applicability of industry standards to products specified.

D. Procedures for handling requests for substitutions made after the award of the Contract are included under Section "Product Substitutions".

1.3 DEFINITIONS:

A. Definitions used in this Section are not intended to change the meaning of other terms used in the Contract Documents, such as "specialties", "systems", "structure", "finishes", "accessories", and similar terms. Such terms are self-explanatory and have well-recognized meanings in the construction industry.

1. "Products" are items purchased for incorporation in the Work, whether purchased for the Project or taken from previously purchased stock. The term "product" includes the terms "material", "equipment", "system", and terms of similar intent.

a. "Named Products" are items identified by the manufacturer's product name, including make or model designation, indicated in the manufacturer's published product literature, that is current as of the date of the Contract Documents.

b. "Foreign Products", as distinguished from "domestic products", are items substantially manufactured (50 percent or more of value) outside of the United States and its possessions; or produced or supplied by entities substantially owned (more than 50 percent) by persons who are not citizens of or living within the United States and its possessions.

B. "Materials" are products that are substantially shaped, cut, worked, fixed, finished, refined, or otherwise fabricated, processed or installed to form a part of the Work.

C. "Equipment" is a product with operational parts, whether motorized or manually operated, that requires service connections such as wiring or piping.

1.4 SUBMITTALS:

A. Asbestos and PCB Certification: After completion of the installation, but prior to Substantial Completion, the Contractor shall certify in writing that products and materials installed and processes used do not contain asbestos or polychlorinated biphenyls (PCB), using format included in Section 01 78 00 - Project Closeout.

B. Hazardous Materials Notification: In the event that no product or material is available that does not contain asbestos, PCB or other hazardous materials as determined by the Owner, a "Material Safety Data Sheet" (MSDS) equivalent to OSHA Form 20 shall be submitted for that proposed product or material prior to installation.

1.5 QUALITY ASSURANCE:

A. Source Limitations: To the fullest extent possible, provide products of the same kind, from a single source.

1. When specified products are available only from sources that do not or cannot produce a quantity adequate to complete project requirements in a timely manner, consult with the Architect for a determination of the most important product qualities before proceeding. Qualities may include attributes relating to visual appearance, strength, durability, or compatibility. When a determination has been made, select products from sources that produce products that possess these qualities, to the fullest extent possible.

B. Compatibility of Options: When the Contractor is given the option of selecting between two or more products for use on the Project, the product selected shall be compatible with products previously selected, even if previously selected products were also options.

1. Each prime Contractor is responsible for providing products and construction methods that are compatible with products and construction methods of other prime or separate Contractors.

2. If a dispute arises between Contractors over concurrently selectable, but incompatible products, the Architect will determine which products shall be retained and which are incompatible and must be replaced.

C. Foreign Product Limitations: Except under one or more of the following conditions, provide domestic products, not foreign products, for inclusion in the work:

1. No available domestic product complies with the Contract Documents.

2. Domestic products that comply with the Contract Documents are only available at prices or terms that are substantially higher than foreign products that also comply with the Contract Documents.

D. Nameplates: Except for required labels and operating data, do not attach or imprint manufacturer's or producer's nameplates or trademarks on exposed surfaces of products that will be exposed to view in occupied spaces or on the exterior.

1. Labels: Locate required product labels and stamps on a concealed surface or, where required for observation after installation, on an accessible surface that is not conspicuous.

2. Equipment Nameplates: Provide a permanent nameplate on each item of service-connected or power-operated equipment. Locate on an easily accessible surface that is inconspicuous in occupied spaces. The nameplate shall contain the following information and other essential operating data:

- Name of product and manufacturer
- Model and serial number
- Capacity
- Speed
- Ratings
- Electrical requirements

1.6 PRODUCT DELIVERY, STORAGE, AND HANDLING:

A. Deliver, store, and handle products in accordance with the manufacturer's recommendations, using means and methods that will prevent damage, deterioration and loss, including theft.

1. Schedule delivery to minimize long term storage at the site and to prevent overcrowding of construction spaces.

2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, or other losses.

3. Deliver products to the site in the manufacturer's original sealed container or other packaging systems, complete with labels and instructions for handling, storing, unpacking, protecting and installing.

4. Inspect products upon delivery to ensure compliance with the Contract Documents, and to ensure that products are undamaged and properly protected.

5. Store products at the site in a manner that will facilitate inspection and measurement of quantity or counting of units.

6. Store heavy materials away from the Project structure in a manner that will not endanger the supporting construction.

7. Store products subject to damage by the elements above ground, undercover in a weathertight enclosure, with ventilation adequate to prevent condensation. Maintain temperature and humidity within range required by manufacturer's instructions.

1.7 UNAUTHORIZED MATERIALS:

A. Materials and products required for work of this Project shall not contain any asbestos, polychlorinated biphenyls (PCB), or other hazardous materials identified by the Owner.

1.8 PRODUCT SELECTION:

A. General Product Requirements: Provide products that comply with the Contract Documents, that are undamaged and, unless otherwise indicated, unused at the time of installation.

1. Provide products complete with all accessories, trim, finish, safety guards, and other devices and details needed for a complete installation and for the intended use and effect.

2. Standard Products: Where available, provide standard products of types that have been produced and used successfully in similar situations on other projects.

B. Product Selection Procedures: Product selection is governed by the Contract Documents and governing regulations, not by previous Project experience. Procedures governing product selection include the following:

1. Proprietary Specification Requirements: Where only a single product or manufacturer is named, provide the product indicated. No substitutions will be permitted.

2. Semi-proprietary Specification Requirements: Where two or more products or manufacturers are named, provide one of the products indicated. No substitutions will be permitted.

a. Where products or manufacturers are specified by name, accompanied by the term "or equal", "or approved equal", or words of similar meaning, comply with the Contract Document provisions concerning "substitutions" to obtain approval for use of an unnamed product.

C. Non-Proprietary Specifications: Where the Specifications list products or manufacturers that are available and may be incorporated in the work, but do not restrict the Contractor to use of these products only, the Contractor may propose any available product that complies with Contract requirements. Comply with Contract Document provisions concerning "substitutions" to obtain approval for use of an unnamed product.

D. Descriptive Specification Requirements: Where Specifications describe a product or assembly, listing exact characteristics required, with or without the use of a brand or trade name, provide a product or assembly that provides the characteristics and otherwise complies with Contract requirements.

E. Performance Specification Requirements: Where Specifications require compliance with performance requirements, provide products that comply with these requirements, and are recommended by the manufacturer for the application indicated. The general overall performance of a product is implied where the product is specified for a specific application.

1. Manufacturer's recommendations may be contained in the published product literature, or by the manufacturer's certification or performance.

F. Compliance with Standards, Codes, and Regulations: Where the Specifications only require compliance with an imposed code, standard or regulation, select a product that complies with the standards, codes or regulations specified.

G. Visual Matching: Where Specifications require matching an established sample, the Architect's decision will be final on whether a proposed product match satisfactorily.

1. Where no product available within the specified category matches satisfactorily and also comply with other specified requirements, comply with provisions of the Contract Documents concerning "substitutions" for selection of a matching product in another product category, or for noncompliance with specified requirements.

H. Visual Selection: Where specified product requirements include the phrase "....as selected from manufacturer's standard colors, patterns, textures..." or a similar phrase, select a product and manufacturer that complies with other specified requirements. The Architect will select the color, pattern and texture from the product line selected.

I. Allowances: Refer to individual Specification Sections and "Allowance" provisions in Division 1 for allowances that control product selection, and for procedures required for processing such selections.

1.9 INSTALLATION OF PRODUCTS:

A. Comply with manufacturer's instructions and recommendations for the installation of products in the applications indicated. Anchor each product securely in place, accurately located and aligned with other work.

1.10 PROTECTION AFTER INSTALLATION:

A. Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.

B. Control traffic to prevent damage to materials, equipment, and surfaces.

C. Cover projections, wall corners, jambs, sills, and soffits of openings in area used for traffic and passage of products in subsequent work.

D. Floors and Stairs:

1. Protect finished floors and stairs from dirt and damage.

2. In other areas subject to foot traffic, secure heavy paper, sheet goods, or other materials in place without damaging final finished surfaces.

3. For the movement of heavy products, lay planking or similar materials in place.

4. Maintain protection materials in good condition while in use.

END OF SECTION

SECTION 01 63 00
PRODUCT SUBSTITUTIONS

1.1 RELATED DOCUMENTS:

A. Drawings and general provisions of Contract, including General and Supplementary General Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY:

A. This Section specifies requirements for handling requests for substitutions made after the award of the Contract.

B. The Contractor's Construction Schedule and Schedule of Submittals are included under Section 01 33 00 - Submittals.

C. Standards: Refer to Section 01 42 00 - Reference Standards for applicability of industry standards to products specified.

1.3 DEFINITIONS:

A. Definitions used in this Section are not intended to change or modify the meaning of other terms used in the Contract Documents.

B. Substitutions: Requests for changes in products, materials, equipment, and methods of construction required by Contract Documents proposed by the Contractor after award of the Contract are considered requests for "substitutions". The following are not considered substitutions:

1. Substitutions requested by Bidders during the bidding period, and accepted prior to award of Contract, are considered as included in the Contract Documents and are not subject to requirements specified in this Section for substitutions.

2. Revisions to Contract Documents requested by the Owner or Architect.

3. Specified options of products and construction methods included in Contract Documents.

4. The Contractor's determination of and compliance with governing regulations and orders issued by governing authorities.

1.4 SUBMITTALS:

A. Substitution Request Submittal: The Architect will consider requests for substitution if received within 60 days after the commencement of the Work. Requests received more than 60 days after commencement of the Work may be considered or rejected at the discretion of the Architect.

1. Submit 3 copies of each request for substitution for consideration.

a. A reproduction of "Substitution Request Form", included as the last page of this Section, must be used and filled in for each request for substitution.

2. Identify the product or the fabrication or installation method to be replaced in each request. Include related Specification Section and Drawing numbers. Provide

complete documentation showing compliance with the requirements for substitutions, and the following information, as appropriate:

a. Product data, including drawings and descriptions of products, fabrication, and installation procedures.

b. Samples, where applicable or requested.

c. A detailed comparison of significant qualities of the proposed substitution with those of the Work specified. Significant qualities may include elements such as size, weight, durability, performance, and visual effect.

d. Coordination information, including a list of changes or modifications needed to other parts of the Work and to construction performed by the Owner and separate Contractors, that will become necessary to accommodate the proposed substitution.

e. A statement indicating the substitution's effect on the Contractor's Construction Schedule compared to the schedule without approval of the substitution. Indicate the effect of the proposed substitution on overall Contract Time.

f. Cost information, including a proposal of the net change, if any, in the Contract sum.

g. Certification by the Contractor that the proposed substitution is equal to or better in every significant respect to that required by the Contract Documents, and that it will perform adequately in the application intended. Include the Contractor's waiver of rights to additional payment or time, that may subsequently become necessary because of the failure of the substitution to perform adequately.

B. Architect's Action: Within one week of receipt of the request for substitution, if necessary, the Architect will request additional information or documentation necessary for evaluation of the request. Within 2 weeks of receipt of the request, or one week of receipt of additional information or documentation, whichever is later, the Architect will notify the Contractor of acceptance or rejection of the proposed substitution. If a decision on the use of a proposed substitute cannot be made or obtained within the time allocated, use the product specified by name. Acceptance will be in the form of a Change Order. Do not use any substitute materials or equipment without written approval of the Architect.

1.5 SUBSTITUTIONS:

A. Conditions: The Contractor's substitution request will be received and considered by the Architect when one or more of the following conditions are satisfied, as determined by the Architect; otherwise requests will be returned without action except to record noncompliance with these requirements.

1. Extensive revisions to Contract Documents are not required.

2. Proposed changes are in keeping with the general intent of the Contract Documents.

3. The request is timely, fully documented, and properly submitted.

4. The request is directly related to an "or equal" clause or similar language in the Contract Documents.

5. The specified product or method of construction cannot be provided within the Contract Time. The request will not be considered if the product or method cannot be provided because of the failure to pursue the Work promptly or coordinate activities properly.

6. The specified product or method of construction cannot receive necessary approval by a governing authority, and the requested substitution can be approved.

7. A substantial advantage is offered the Owner, in terms of cost, time, energy conservation, or other considerations of merit, after deducting offsetting responsibilities the Owner may be required to bear. Additional responsibilities for the Owner may include additional compensation to the Architect for redesign and evaluation services, increased cost of other construction by the Owner or separate Contractors, and similar considerations.

8. The specified product or method of construction cannot be provided in a manner that is compatible with other materials, and where the Contractor certifies that the substitution will overcome the incompatibility.

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

10. Where a proposed substitution involves more than one prime Contractor, each Contractor shall cooperate with the other Contractors involved to coordinate the Work, provide uniformity and consistency, and to assure compatibility of products.

B. The Contractor's submittal and Architect's acceptance of Shop Drawings, Product Data, or Samples that relate to construction activities not complying with the Contract Documents does not constitute an acceptable or valid request for substitution, nor does it constitute approval.

C. Substitute products shall not be ordered or installed without the written approval of the Architect.

1.6 APPROVED SUBSTITUTIONS:

A. For approved substitutions, submit shop drawings, product data, and samples in accordance with Section 01 33 00 - Submittals.

1.7 SUBSTITUTION REQUEST FORM: (See next page)

END OF SECTION

(Intentionally left blank.)

SUBSTITUTION REQUEST FORM:

TO:

Walter Robbs Architects,
a Michael Graves Company
530 N. Trade Street, Ste 301
Winston-Salem, NC 27101

COPY TO:

PROJECT: _____ WR/MG PROJECT NO. _____

SPECIFIED ITEM: _____

Section _____ Paragraph _____ Description _____

The undersigned requests consideration of the following:

PROPOSED SUBSTITUTION: _____

Upon submitting this Request for Substitution, the undersigned certifies that the following paragraphs are correct unless otherwise modified on attachments:

1. The Contractor has investigated the proposed substitution and believes that it is equal to or superior in all respects to the specified item and will conform to design requirements and aesthetic effect.
2. The cost-saving or additional cost to the Owner for accepting substitution:
   $_____ savings or $_____ additional cost.
3. The Contractor will pay the Architect and/or Engineers for additional studies, investigations, submittal reviews, redesign and/or analysis caused by the requested substitution, and at no additional cost to Owner.
4. Substitution requires dimensional changes or redesign of structure or PME Work:
   No ☐ Yes ☐ (If yes, attach complete data).
5. The Contractor will waive future claims for added cost to Contract caused by substitution.
6. Changes in Contract Time caused by substitution: No ☐ Yes ☐ Add/Deduct _____ days.
7. Adverse effect on other Trades caused by substitution: None ☐ Yes ☐ (If yes, explain on attachment).
8. The Contractor will modify other parts of the Work as may be required to make all parts of Work complete and functioning properly. Yes ☐ (Explain on attached page if necessary).
9. The same type of warranty for specified product will be furnished of proposed substitution:
   Yes ☐ No ☐
10. Maintenance service available? Yes ☐ No ☐ Where? _____
11. The Contractor has complied with requirements of Section 01630 - Substitutions and the Contract Documents as part of request for substitution and has filled in this form. Yes☐ No ☐

REASON FOR NOT GIVING PRIORITY TO SPECIFIED ITEM: See attached ☐ Not required ☐

Submitted by: _____ Architect's Response:

Signature _____ _____ Approved

Contractor _____ _____ Approved as Noted

Address _____ _____ Rejected

_____ Signature: _____

Date _____ Firm: _____

Telephone _____ Date: _____

REQUIRED ATTACHMENTS:

1. Product Data for Specified Item: Clearly marked to indicate full compliance with Specification Section and Contract Documents: Attached ☐
2. Product Data for Substitution: Clearly marked for adequate evaluation and comparison with data submitted for specified item: Attached ☐
3. Samples: Attached ☐ Not Required ☐
4. Cost Data and Implications of Substitution Attached ☐ Not Required ☐
5. Contractor's Comments: Attached ☐ Not Required ☐
6. Other: _____

END OF FORM

SECTION 01 73 00
CUTTING AND PATCHING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

A. Drawings and general provisions of the Contract, including General and Supplementary General Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY:

A. This Section includes administrative and procedural requirements for cutting and patching.

B. Refer to other Sections for specific requirements and limitations applicable to cutting and patching.

C. Requirements of this Section apply to mechanical and electrical installation. Refer to Division 23 and Division 26 Sections for other requirements and limitations applicable to cutting and patching mechanical and electrical installations.

D. Contractor shall be responsible for the following, but not limited to, cutting, fitting, and patching requirements:

1. Make parts fit together properly, including interfaces with existing building elements.

2. Uncovering portions of the Work to provide for the installation of ill-timed work including inspections as required.

3. Removing and replacing work not conforming to requirements of Contract Documents.

4. Removing and replacing defective work.

5. Removing samples of installed work as specified for testing.

1.3 SUBMITTALS:

A. Cutting and patching proposal:

1. Submit a written proposal to the Architect at least ten days in advance of performing any cutting or alterations which affects the following:

a. Work of Owner or any separate contract.

b. Structural elements of the project.

c. Life expectancy, maintenance, efficiency or safety of operational elements.

d. Aesthetic qualities of visually exposed elements.

2. Include the following information in proposal:

a. Identification of Project.

b. Description of affected work.

c. The extent of cutting and patching required and how it is to be performed; indicate why it cannot be avoided.

d. Anticipated results in terms of changes to construction; including changes to structural elements and operating components as well as changes in the building's appearance and other significant visual elements.

e. Products proposed for use.

f. Firms or entities that will perform the Work.

g. Utilities that will be disturbed or affected, including those that will be relocated and those that will be temporarily out-of-service. Indicate how long service will be disrupted.

h. Alternative methods, if applicable.

i. Cost proposal, when applicable.

j. The written permission of any separate Contractors whose work will be affected.

k. Dates and times when cutting and patching work are to be performed.

3. Should conditions of the work or the schedule indicate a change of products from the original installation, the Contractor shall submit a request.

B. Approval by the Architect to proceed with cutting and patching does not waive the Architect's right to later require complete removal and replacement of a part of the Work found to be unsatisfactory.

PART 2 - PRODUCTS

2.1 MATERIALS:

A. Use materials identical to original installed materials. If identical materials cannot be used where exposed surfaces are involved, use materials that match original adjacent surfaces to the fullest extent possible with regard to the visual effect. Use materials whose installed performance will equal or surpass that of original materials installed. Comply with specification sections for type of work to be performed.

PART 3 - EXECUTION

3.1 EXAMINATION:

A. Examine project conditions and surfaces to receive work including elements subject to damage or movement during cutting and patching operations. Take corrective action if unsafe or unsatisfactory conditions are encountered before proceeding with work.

B. Inspect conditions affecting the installation of products or performance of the work after uncovering or removal of work.

C. Inspect structural support elements that are concealed and exposed after removal for repairs or patching, for indications of loss of structural integrity, rot, rust, corrosion, or other similar conditions. Notify Architect if additional work or corrective measures are required.

D. Report unsatisfactory or questionable conditions to Architect in writing. Do not proceed with work until Architect has provided further instructions.

3.2 PREPARATION:

A. Temporary supports: Provide adequate temporary supports for work to be cut and, as necessary, to ensure the structural integrity of the affected portion of the work. Install temporary supports so as not to damage the work installed or existing construction.

B. Protection:

1. Protect adjacent construction during cutting and patching work to prevent damage.

2. Provide materials, devices, and methods as required to protect workers and adjacent surfaces.

3. Protect portions of the work exposed to the elements which may be exposed by cutting and patching work.

4. Maintain excavations free from water.

C. Avoid interference with the use of adjoining areas or interruption of free passage to adjoining areas.

D. Take precautions necessary to avoid cutting pipes, conduits, or ductwork serving the building including those scheduled to be removed or relocated until provisions have been made to bypass them.

3.3 WORKMANSHIP:

A. Employ skilled workmen to perform cutting and patching work.

B. Retain original installers or fabricators to the greatest extent possible to perform cutting and patching work for the following:

1. Waterproofed or moisture-resistant elements.

2. Visually exposed finished surfaces.

C. Perform demolition and cutting work by methods that will not damage adjacent construction and will provide proper surfaces for patching work.

D. Perform installation, fitting and adjustment of products to comply with the manufacturer's product data, its intended functions, specified tolerances and finishes.

E. Restore work which has been cut or removed; install new products to provide completed Work in accordance with requirements of Contract Documents.

F. Fit work tight around pipes, sleeves, ducts, conduits, and other penetrations through non-rated construction. Firestop penetrations using approved materials to cut-off and conceal draft openings in compliance with governing building codes.

G. Where cutting and patching is required on work of fire-resistive construction, perform work so as not to alter the fire-resistive integrity of the construction. Penetrations required through fire-resistive construction shall be fire stopped using a Through-Penetration Firestop System, Classified by Underwriters Laboratories or Factory Mutual Approved, tested in accordance with ASTM E814-88 and complying with requirements of the governing building code. Obtain required inspections and approval of local building officials prior to covering or concealing the work performed.

H. Refinish surfaces to provide an even, uniform finish to match adjacent finishes and as follows:

1. For continuous surfaces: Refinish to the nearest intersection.

2. For an assembly: Refinish the entire unit.

3.4 CUTTING:

A. Perform cutting using methods least likely to damage elements to be retained on adjoining construction. Where possible review proposed procedures with the original installer; comply with original installer's recommendation.

B. Use hand or small power tools designed for sawing and grinding, not hammering and chopping, where cutting is required.

C. Cut holes and slots neat to sizes required with minimum disturbance to adjacent surfaces. Temporarily cover the opening when not in use.

D. Avoid marring finished surfaces, cut or drill from exposed or finished side into concealed surfaces.

E. Perform cutting through concrete or masonry using cutting machines designed for this purpose such as carborundum saws or diamond core drills.

F. Where utility services are required to be removed, relocated or abandoned, by-pass services such as pipes or conduits before cutting.

1. Cut-off pipes or conduits in walls or partitions to be removed.

2. Cap, valve, or plug and seal the remaining portion of the pipe or conduit to prevent entrance of moisture or other foreign matter after by-passing and cutting.

3.5 PATCHING:

A. Patch with durable seams that are as invisible as possible.

B. Where possible, inspect and test patched areas to demonstrate the integrity of installation.

C. Restore exposed finishes of patched areas and areas extending into adjoining construction, including damaged surfaces and finishes, in a manner that will be indistinguishable in the finished work.

3.6 CLEANING:

A. Clean areas and spaces where cutting and patching is performed or used as access.

B. Remove excess paint mortar, oils, putty, and items of similar nature from patched work.

C. Clean pipes, conduits, and similar items before painting or other finishing is applied.

D. Restore damaged pipe covering to its original condition.

END OF SECTION

SECTION 01 74 00
CLEANING UP

PART 1 - GENERAL

1.1 DESCRIPTION OF WORK

A. Work Included This Section:

1. This Section specifies administrative and procedural requirements for final cleaning at Substantial Completion.

B. Environmental Requirements:

1. Conduct cleaning and waste disposal operations in compliance with all laws and ordinances. Comply fully with federal and local environmental and anti-pollution regulations.

2. Burning or burying of debris, rubbish, or other waste material on the premises shall not be permitted.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.1 REMOVAL OF DEBRIS:

A. All debris and waste materials shall become the property of the Contractor and the Contractor shall be responsible for removal of the debris from the Project Site on a periodic basis no less frequently than weekly. The Contractor shall be responsible for cleanup of his own waste materials and debris.

3.2 MUD AND DUST FROM MOVEMENT OF VEHICLES:

A. The Contractor shall not allow mud, earth-droppings, and dust to accumulate for more than one day before removing such from public streets. At no time shall any accumulation be allowed which will create a hazard to safety or which will create bad public relations.

B. The measures to be used to prevent littering the pavement shall meet DEHNR requirements and shall include (but does not constitute the only measure to be used, if necessary) the following:

1. Maintain dust control.

2. Wash and/or sweep paved areas.

3. Pick up droppings as they occur.

C. Failure to clean streets promptly (within one day's notice) will result in the Owner having streets cleaned and deducting costs for the same from Contractors' Contract Price.

3.3 FINAL CLEAN-UP:

A. Before final inspection and acceptance of the Project, the Contractor shall clean work under the Contract, exterior and interior, to such an extent that the Owner can occupy and use the building for its intended purpose with no cleaning required by the Owner.

B. General:

1. Employ experienced workers or cleaners for final cleaning. Clean each surface or unit of work to the condition expected from a professional building cleaning and maintenance program. Comply with manufacturer's instructions.

2. Complete the following cleaning operations before requesting inspection for Certification of Substantial Completion for the entire project or a portion of the Project:

a. Clean the Project site, yard, and grounds, in areas disturbed by demolition activities of rubbish, waste materials, litter and foreign substances. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits. Rake grounds that are neither planted nor paved, to a smooth even-textured surface.

b. Remove tools, construction equipment, machinery, and surplus material from the site.

END OF SECTION

SECTION 01 75 00
DOCUMENTS AT PROJECT SITE

1.1 DOCUMENTS AT THE PROJECT SITE:

A. The Contractor shall maintain at the Project Site one complete set of Drawings and Specifications, including all Addenda, Change Orders, and other official changes thereto, for his work. The Drawings and Specifications shall be maintained in good order and readable condition. The Drawings and Specifications shall be marked in red to show changes in the work required by Addenda, Change Orders, or other change directives, and shall show as-built changes. Changes shall be so noted immediately upon notification of completion of the changed work.

B. The Contractor shall also maintain at the Project Site approved submittals, shop drawings, and erection drawings. These documents shall be maintained in good order and readable condition.

C. All of the documents required at the Project Site under this Section shall be available for use by the Owner, or their representative, at all times.

D. Upon completion of the Project, the documents required under this Section shall be turned over to the Architect for the Owner.

END OF SECTION

SECTION 01 78 00
CONTRACT/ PROJECT CLOSE-OUT

1.1 RELATED DOCUMENTS:

A. Drawings and general provisions of the Contract, including General and Supplementary General Conditions and other Division 1 Specifications Sections, apply to work of this Section.

1.2 SUMMARY:

A. This Section includes administrative and procedural requirements for Project close-out including, but not limited to, the following:

- Inspection procedures
- Project record documents
- Operation and maintenance manuals
- Guarantees and warranties
- Affidavits
- Quantity allowances and cash allowances

1.3 INSPECTION PROCEDURES FOR SUBSTANTIAL COMPLETION AND FINAL COMPLETION:

A. Follow procedures as specified in Article 9 of the General Conditions (AIA Document A201) and the Supplementary General Conditions.

1.4 RECORD DOCUMENTS:

A. Record Contract Drawings: Maintain and submit to Architect a clean, undamaged set of record Contract Drawings. Mark the set to show the actual installation where the installation varies substantially from the Work as originally shown. Mark which drawing is most capable of showing conditions fully and accurately. Where Shop Drawings are used, record a cross-reference at the corresponding location on the Contract Drawings

B. Record Shop Drawings: Maintain and submit to Architect a clean, undamaged set of record Shop Drawings. Mark the Shop Drawings to show the actual installation where the installation varies substantially from the Work as originally shown. Record a cross-reference at the corresponding location on the Contract Drawings.

C. Record Specifications: Maintain and submit to Architect one complete copy of the Project Manual, including addenda. Include with the Project Manual one copy of other written construction documents, such as Change Orders and modifications issued in printed form during construction. Mark these Documents to show substantial variations in actual Work performed in comparison with the text of the Specifications and Modifications.

D. Record Product Data: Maintain and submit to Architect one copy of each Product Data submittal. Note related Change Orders or any other modifications issued during construction. Mark these Documents to show significant variations in actual Work performed in comparison with information submitted.

E. Record Submittals: Maintain and submit to Architect one copy of all approved submittals.

F. See Section 01 75 00 - Record Documents for additional information.

1.5 OPERATION AND MAINTENANCE MANUALS:

A. Each Prime Contractor shall submit to Architect before final acceptance of the Project, 2 copies (except where required specifically otherwise elsewhere in the Contract Documents) of all installation, operating, and maintenance instructions on equipment and materials furnished under his Contract. Each set of copies shall be bound in a 3-ring loose-leaf binder for 8 1/2" x 11" paper, with black vinyl covers. Label binder designating name of Project, name of Owner, which Prime Contract, and name of Prime Contractor.

B. The following is a list of Operation and Maintenance Manuals required to be delivered to the Architect for the Owner prior to final payment. The Contractor will be required to provide all operation and maintenance manuals specified in Divisions 1 through 33 of these Specifications, even if inadvertently left off of this list.

Operation and Maintenance Manuals:

1. HVAC equipment
2. Electrical equipment
3. Plumbing equipment
4. Fire Protection equipment

1.6 GUARANTEES AND WARRANTIES:

A. Each Prime Contractor shall submit to Architect for the Owner before final acceptance 2 copies of all warranties, guarantees, and surety bonds on the work, as required under his contract. All such documents shall show name of Project, location, and name of Owner. All guarantees and warranties will begin at time of substantial completion.

B. Specific guarantees and warranties (in addition to the general 12-month warranty on the entire Project) include, but are not limited to, those listed below. The Contractor will be required to provide all guarantees and warranties specified in Divisions 1 through 33 of these Specifications, even if inadvertently left off of this list.

Guarantees and Warranties

1. Roofing.
2. Sealants.
3. See drawings for guarantee requirements for mechanical, electrical, and fire protection work.

C. Equipment identification: Submit, in duplicate, diagram/ ledger/ code for identifying the following:
1. HVAC major components.
2. Electrical switchgear.
3. Electrical panels and circuits.

1.7 AFFIDAVITS:

A. Submit to the Architect the following affidavits, in duplicate, properly executed:
1. AIA G 706 Contractor's Affidavit of Payment of Debts and Claims.
2. AIA G 706A Contractor's Affidavit of Release of Liens.
3. AIA G 707 Consent of Surety to Final Payment

1.8 QUANTITY ALLOWANCES AND CASH ALLOWANCES:

A. See Section 01 20 00 for quantity allowances and cash allowances included in the Contract.

B. Compare actual quantities and amounts versus the specified allowances and verify that the proper adjustments have been made by execution of change orders.

1.9 ASBESTOS AND POLYCHLORINATED BIPHENYLS (PCB) FREE CERTIFICATION:

A. After completion of the installation, but prior to Substantial Completion of Project, submit asbestos and polychlorinated biphenyls free certification for all materials and equipment as specified in Division 2 through 33.

B. The certification shall be made only by the Owner, a Partner or a Corporate Officer, or other people duly authorized to sign binding agreements for the Contractor.

C. The certification shall be accompanied by a notarized letter of authorization from the Contractor naming the person duly authorized to sign for the Contractor.

D. The certification shall be on Contractor's letterhead and include the following information:

The undersigned hereby certifies that all products and materials installed, and processes used, do not contain any asbestos or polychlorinated biphenyls (PCB).

(Contractor's Name) _____

Signed: _____

(Printed Name) _____

Position: _____

Date: _____

1.10 OTHER SUBMITTALS: Comply with submittal requirements specified in other Sections and parts of the Project Manual.

END OF SECTION

SECTION 01 83 00
EQUIPMENT MAINTENANCE AND OPERATIONS PROGRAM

1.1 SCOPE:

A. The Contractor shall set dates, approved by the Architect and Owner, for all major building systems start-up to be observed by the Owner's maintenance and operating personnel.

B. The various subcontractors involved in the following areas shall prepare to start-up, shut-down and operating procedures for the following:

- Electrical systems
- Mechanical systems
- Water supply and treatment equipment
- Fluid waste treatment and disposal equipment

C. Programs of instruction for the Owner's maintenance and operating personnel shall be prepared for the systems listed above, to be approved by the Architect and Owner, in order to explain the proper maintenance and operation of the building systems.

1.2 SCHEDULING:

A. The Owner's project representative will be responsible for the coordination of the maintenance and operating personnel. He shall advise the Architect of any problems which may occur in the operating procedures.

B. The Owner's maintenance and operating personnel will only enter the job site at the request of the Owner's project representative and with the approval of the Architect and Contractor. All comments from the maintenance and operating personnel shall be forwarded to the Contractor through the Architect.

C. This program shall be implemented prior to the Final Inspection of the Project.

END OF SECTION

SECTION 02 41 19
SELECTIVE DEMOLITION

PART 1: GENERAL

1.1 RELATED DOCUMENTS:

A. Drawings and general provisions of Contract, including General and Supplementary General Conditions and Division 1 Specification Sections, apply to work of this Section.

1.2 DESCRIPTION OF WORK:

A. The extent of selective demolition work is indicated on the Drawings.

B. Types of Selective Demolition Work: Demolition requires the selective removal and subsequent offsite disposal of the following:

1. Portions of building structure indicated on the Drawings and as required to accommodate new construction.

2. Removal of paving, fencing, and other items shown on the site plan of the Drawings.

3. Removal of other items shown on the Drawings.

4. Removal of materials and items as required in order to properly install the new construction.

C. Removal Work Specified Elsewhere:

1. Cutting nonstructural floors and walls for piping, ducts, and conduit is included with the work of the respective mechanical and electrical Divisions 23 and 26 specification sections.

D. Related Work Specified Elsewhere:

1. Remodeling construction work and patching is included within the respective sections of specifications, including removal of materials for reuse and incorporated into remodeling or new construction.

2. Relocation of pipes, conduits, ducts, other mechanical and electrical work is specified by respective trades.

1.3 SUBMITTALS:

A. Progress Schedule: The Contractor's Progress Schedule specified in Paragraph 3.10 of the General Conditions and further in the Supplementary General Conditions is to show clearly the sequence of work as outlined in Section 01 02 00, including dates for the beginning and ending of each sequence of work. As specified in the Supplementary General Conditions, the progress schedule is to be updated monthly and submitted with each payment request. The sequence of demolition work is to be included and shown on the Progress Schedule. Include coordination for shut-off, capping, and continuation of utility services as required, together with details for dust and noise control protection.

B. Provide a detailed sequence of demolition and removal work to ensure the uninterrupted progress of the Owner's on-site operations.

C. Coordinate with Owner's continuing occupation of the existing building.

1.4 JOB CONDITIONS:

A. Occupancy: The Owner will be continuously occupying areas of the building immediately adjacent to areas of selective demolition. Conduct selective demolition work in manner that will minimize need for disruption of Owner's normal operations. Provide minimum of 72 hours advance notice to Owner of demolition activities which will severely impact Owner's normal operations.

B. Condition of Structures: The Owner assumes no responsibility for actual condition of items or structures to be demolished.

1. Conditions existing at the time of commencement of contract will be maintained by the Owner insofar as practicable. However, variations within structure may occur by Owner's removal and salvage operations prior to start of selective demolition work.

C. Partial Demolition and Removal: Items indicated to be removed but of salvable value to the Contractor may be removed from structure as work progresses. Transport salvaged items from site as they are removed.

1. Storage or sale of removed items on-site will not be permitted.

D. Protections: Provide temporary barricades and other forms of protection as required to protect the Owner's personnel and general public from injury due to selective demolition work.

1. Provide protective measures as required to provide free and safe passage of Owner's personnel and the general public to and from occupied portions of building.

2. Provide interior and exterior shoring, bracing, or support to prevent movement, settlement, or collapse of structure or element to be demolished, and adjacent facilities or work to remain.

3. Protect from damage existing finish work that is to remain in place and becomes exposed during demolition operations.

4. Protect floors with suitable coverings when necessary.

5. Construct temporary solid dustproof partitions were required to separate areas where noisy or extensive dirt or dust operations are performed. Equip partitions with dustproof doors and security locks if required.

6. Provide temporary weather protection during the interval between demolition and removal of existing construction on exterior surfaces, and installation of new construction to ensure that no water leakage or damage occurs to structure or interior areas of existing building.

7. Remove protections at the completion of work.

E. Damages: Promptly repair damages caused to adjacent materials or facilities by demolition work at no cost to the Owner.

F. Traffic: Conduct selective demolition operations and debris removal in a manner to ensure minimum interference with roads, streets, walks, and other adjacent occupied or used facilities.

1. Do not close, block or otherwise obstruct streets, walks, or other occupied or used facilities without written permission from authorities having jurisdiction. Provide

alternate routes around closed or obstructed traffic ways if required by governing regulations.

G. Explosives: The use of explosives will not be permitted.

H. Utility Services: Maintain existing utilities indicated to remain, keep in service, and protect against damage during demolition operations.

1. Do not interrupt existing utilities serving occupied or used facilities, except when authorized in writing by authorities having jurisdiction. Provide temporary services during interruptions to existing utilities, as acceptable to governing authorities.

I. Environmental Controls: Use water sprinkling, temporary enclosures, and other suitable methods to limit dust and dirt rising and scattering in the air to lowest practical level. Comply with governing regulations pertaining to environmental protection.

PART 2: (Not Applicable)

PART 3: EXECUTION

3.1 INSPECTION:

A. Prior to the commencement of selective demolition work, inspect areas in which work will be performed. Photograph existing conditions to structure, surfaces, equipment or surrounding properties which could be misconstrued as damage resulting from selective demolition work; file with Architect prior to starting work.

3.2 PREPARATION:

A. Provide interior and exterior shoring, bracing, or support to prevent movement, settlement or collapse of structures to be demolished and adjacent facilities to remain.

1. Cease operations and notify the Architect immediately if the safety of the structure appears to be endangered. Take precautions to support structure until determination is made for continuing operations.

B. Cover and protect furniture, equipment, and fixtures to remain from soiling or damage when demolition work is performed in rooms or areas from which such items have not been removed.

C. Erect and maintain dust-proof partitions and closures as required to prevent spread of dust or fumes to occupied portions of the building.

1. Where selective demolition occurs immediately adjacent to occupied portions of the building, construct dust-proof partitions of minimum 4" studs, 5/8" drywall (joints taped) on occupied side, 1/2" fire-retardant plywood on demolition side, and fill partition cavity with sound-deadening insulation.

2. Provide weatherproof closures for exterior openings resulting from demolition work.

D. Locate, identity, stub off, and disconnect utility services that are not indicated to remain.

1. Provide bypass connections as necessary to maintain continuity of service to occupied areas of building. Provide minimum of 72 hours advance notice to Owner if shut-down of service is necessary during change-over.

3.3 DEMOLITION:

A. Perform selective demolition work in a systematic manner. Use such methods as required to complete work specified herein and indicated on Drawings in accordance with the demolition schedule and governing regulations.

1. Demolish concrete and masonry in small sections. Cut concrete and masonry at junctures with construction to remain using power-driven masonry saw or hand tools; do not use power-driven impact tools.

2. Locate demolition equipment throughout the structure and promptly remove debris to avoid imposing excessive loads on supporting walls, floors or framing.

3. Provide services for effective air and water pollution controls as required by local authorities having jurisdiction.

B. If unanticipated mechanical, electrical, or structural elements which conflict with intended function or design are encountered, investigate and measure both nature and extent of the conflict. Submit report to Architect in written, accurate detail. Pending receipt of directive from Architect rearranges a selective demolition schedule as necessary to continue overall job progress without delay.

3.4 SALVAGE MATERIALS:

A. The Owner will remove materials and equipment that he desires to retain prior to the beginning of construction relative to each phase of construction.

B. During construction, all materials and equipment required to be demolished and removed shall become the property of the Contractor and he shall dispose of these off-sites.

3.5 DISPOSAL OF DEMOLISHED MATERIALS:

A. Remove debris, rubbish, and other materials resulting from demolition operations from the building site. Transport and legally dispose of materials off-site.

1. If hazardous materials are encountered during demolition operations, comply with applicable regulations, laws, and ordinances concerning removal, handling, and protection against exposure or environmental pollution.

2. Burning of removed materials is not permitted on the project site.

3.6 CLEAN-UP AND REPAIR:

A. Upon completion of demolition work, remove tools, equipment, and demolished materials from site. Remove protections and leave interior areas broom clean.

B. Repair demolition performed more than that required. Return structures and surfaces to remain to the condition existing prior to commencement of selective demolition work. Repair adjacent construction or surfaces soiled or damaged by selective demolition work.

END OF SECTION

SECTION 03 10 00 - CONCRETE FORMWORK

PART 1 – GENERAL

1.1 RELATED DOCUMENTS: Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to work of this Section.

1.2 SCOPE:

A. Related Work Specified Elsewhere:

1. Concrete Reinforcement and Accessories (Section 03 20 00).
2. Cast-In-Place Concrete (Section 03 30 00).

B. Work Included In This Section:

1. Extent of formwork is indicated by the concrete structures shown on the contract drawings and as required to place concrete.
2. Work shall include (except as specified elsewhere in the contract documents) providing formwork and shoring for all cast-in-place concrete and installation into the formwork items furnished by others, such as anchors, plates, inserts, and any other items embedded in concrete.

1.3 INDUSTRY STANDARDS:

A. Reference: Some products and execution are specified in this section by reference to published specifications of standards of the following (latest edition, with respective abbreviations used):

American Concrete Institute (ACI)
The American Society for Testing and Materials (ASTM)
U. S. Product Standards (PS)

B. Standard Specifications and Codes: The following specifications and codes form a part of this specification:

Publications of the American Concrete Institute:

ACI 347 "Recommended Practice for Concrete Formwork"
ACI 117 "Standard Tolerances for Concrete Construction and Materials"

1.4 SUBMITTALS:

A. Manufacturer's Data: Submit (for information only) manufacturer's specifications for proprietary materials and items as required, including form coatings, formwork facing material, jointing, reveals, etc., ties, and accessories.

B. Shop drawings for formwork structure, including the location of shoring and reshoring, are the responsibility of the Contractor and shall be submitted to the Engineer for information only.

C. Product Data: For each of the following:

1. Exposed surface form-facing material.
2. Concealed surface form-facing material.
3. Form liners.
4. Form ties.
5. Form-release agent.

D. Sustainable Design Submittals

E. Shop Drawings: Prepared by, and signed and sealed by, a qualified professional engineer responsible for their preparation, detailing fabrication, assembly, and support of forms.

1. For exposed vertical concrete walls, indicate dimensions and form tie locations.
2. Indicate dimension and locations of construction and movement joints required to construct the structure in accordance with ACI 301 (ACI 301M).

a. Location of construction joints is subject to approval of the Architect.

1.5 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference.

1. Review the following:
   a. Special inspection and testing procedures for field quality control.
   b. Construction, movement, contraction, and isolation joints
   c. Forms and form-removal limitations.
   d. Shoring and reshoring procedures.
   e. Anchor rod and anchorage device installation tolerances.

PART 2 – PRODUCTS

2.1 FORM MATERIALS AND ACCESSORIES:

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.
2. Exterior-grade plywood panels, suitable for concrete forms, complying with DOC PS 1, and as follows:

a. High-density overlay, Class 1 or better.
b. Medium-density overlay, Class 1 or better; mill-release agent treated and edge sealed.
c. Structural 1, B-B or better; mill oiled and edge sealed.
d. B-B (Concrete Form), Class 1 or better; mill oiled and edge sealed.

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. Forms for Cylindrical Columns, Pedestals, and Supports: Metal, glass-fiber-reinforced plastic, paper, or fiber tubes that will produce surfaces with gradual or abrupt irregularities not exceeding specified formwork surface class. Provide units with sufficient wall thickness to resist plastic concrete loads without detrimental deformation.

D. Pan-Type Forms: Glass-fiber-reinforced plastic or formed steel, stiffened to resist plastic concrete loads without detrimental deformation.

E. 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 units that will leave no corrodible metal closer than 1 1/2 inches to the plane of exposed concrete surface.
2. Furnish ties that, when removed, will leave holes no larger than 1 inch in diameter in concrete surface.
3. Furnish ties with integral water-barrier plates to walls indicated to receive dampproofing or waterproofing.

F. Chamfer Strips: Wood, metal, PVC, or rubber strips, 3/4 by 3/4 inch minimum.

G. Rustication Strips: Wood, metal, PVC, or rubber strips, kerfed for ease of form removal.

H. Form-Release Agent: Commercially formulated form-release agent that does not bond with, stain, or adversely affect concrete surfaces and does not impair subsequent treatments of concrete surfaces.

1. Formulate form-release agent with rust inhibitor for steel form-facing materials.

I. Form Ties: Factory-fabricated, removable or snap-off, glass-fiber-reinforced plastic or metal form ties designed to resist lateral pressure of fresh concrete on forms and to prevent spalling of concrete on removal.

1. Furnish units that leave no corrodible metal closer than 1 inch (25 mm) to the plane of exposed concrete surface.
2. Furnish ties that, when removed, leave holes no larger than 1 inch (25 mm) in diameter in concrete surface.

3. Furnish ties with integral water-barrier plates to walls indicated to receive dampproofing or waterproofing.

PART 3 – EXECUTION

3.1 DESIGN OF FORMWORK:

A. The Contractor shall be responsible for the design of all concrete formwork. Formwork shall be designed in accordance with ACI 347 unless noted.

B. Design, erect, support, brace, and maintain formwork so that it will safely support vertical and lateral loads that might be applied until such loads can be supported by the concrete structure. Construct formwork so that concrete members and structures are of correct size, shape, alignment, elevation, and position.

C. Design forms and falsework to include assumed values of live load, dead load, weight of moving equipment operated on formwork, concrete mix, height of concrete drop, vibrator frequency, ambient temperature, stresses, lateral stability, and other factors pertinent to safety of structure during construction.

D. Support form facing materials by structural members spaced sufficiently close to prevent deflection. Fit forms placed in successive units for continuous surfaces to accurate alignment, free from irregularities, and within allowable tolerances.

E. Provide formwork sufficiently tight to prevent leakage of cement paste during concrete placement. Solidly butt joints and provide backup material at joints as required to prevent leakage and fins.

F. Provide for openings, offsets, keyways, recesses, moldings, rustications, reglets, chamfers, blocking, screeds, bulkheads, anchorages and inserts, and other features required in work.

G. Fabricate forms for easy removal without hammering or prying against concrete surfaces. Provide crush plates or wrecking plates where stripping may damage cast concrete surfaces. Provide top forms for inclined surfaces where slope is too steep to place concrete with bottom forms only. Kerf wood inserts for forming keyways, reglets, recesses, and the like, for easy removal.

H. Provide temporary openings where interior area of formwork is inaccessible for cleanout, for inspection before concrete placement, and for placement of concrete. Securely brace temporary openings and set tightly to forms to prevent loss of concrete mortar. Locate temporary openings on forms at inconspicuous locations.

I. Chamfer exposed corners and edges unless otherwise indicated, or specified, using wood, metal, PVC or rubber strips fabricated to produce uniform lines and tight edge joints.

J. Provisions for Other Trades: Provide openings in concrete formwork to accommodate work of other trades. Determine size and location of openings,

recesses and chases from trades providing such items. Accurately place and securely support items built into forms.

K. Limit deflection of form-facing panels to not exceed ACI 303.1 requirements.

1. In addition to ACI 303.1 limits on form-facing panel deflection, limit cast-in-place architectural concrete surface irregularities, designated by ACI 347 as abrupt or gradual, as follows:
2. Concrete Exposed to view: Class A, 1/8 inch
3. Unexposed Surfaces: Class B, 1/4 inch

L. Construct forms to result in cast-in-place architectural concrete that complies with ACI 117.

M. Clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, and other debris just before placing concrete.

N. Retighten forms and bracing before placing concrete, as required, to prevent mortar leaks and maintain proper alignment.

3.2 TOLERANCES: Formwork shall be constructed so as to ensure that the concrete surfaces will conform to the tolerances of Section 203.1 "Recommended Practice for Concrete Formwork" (ACI 347).

3.3 REUSE OF FORMS:

A. 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. Apply new form coating compound material to concrete contact surfaces as specified for new formwork.

B. When forms are extended for successive concrete placement, thoroughly clean surfaces, remove fins and laitance, and tighten forms to close all joints. Align and secure joints to avoid offsets. Do not use "patched" forms for exposed concrete surfaces.

C. Leave formwork for beam soffits, joists, slabs, and other structural elements that supports weight of concrete in place until concrete has achieved at least 75 percent of its 28-day design compressive strength.

D. Remove forms only if shores have been arranged to permit removal of forms without loosening or disturbing shores.

E. 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.

3.4 CLEANING AND TIGHTENING: Thoroughly clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, and other debris just before concrete is to be placed. Tighten forms immediately after concrete placement as required to eliminate mortar leaks.

3.5 FORM COATINGS:

A. Coat form contact surfaces with form-coating compound before reinforcement is placed. Provide commercial formulation form-coating compounds that will not bond with, stain, nor adversely affect concrete surfaces, and will not impair subsequent treatment of concrete surfaces requiring bond of adhesion, nor impede the wetting of surfaces to be cured with water or curing compounds.

B. Do not allow excess form coating material to accumulate in the forms or to come into contact with concrete surfaces against which fresh concrete will be placed. Apply in compliance with manufacturer's instructions.

3.6 EMBEDDED ITEMS: Set and build into the work anchorage devices and other embedded items required for other work that is attached to, or supported by, cast-in-place concrete. Use setting drawings or instructions, and directions provided by suppliers of the items to be attached.

A. 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."

B. Install reglets to receive waterproofing and to receive through-wall flashings in outer face of concrete frame at exterior walls, where flashing is shown at lintels, shelf angles, and other conditions.

3.7 FORM REMOVAL: Formwork, not supporting concrete, may be removed 24 hours after placing concrete, provided concrete is sufficiently hard to not be damaged by form removal operations, and provided that curing and protection operations are maintained. Formwork for surfaces specified to be "rubbed" is to be removed within 24 hours after placement. Immediately after rubbing, curing is to be reinstated.

A. Leave formwork for beam soffits, joists, slabs, and other structural elements that supports weight of concrete in place until concrete has achieved at least 75 percent of its 28-day design compressive strength.

3.8 CONCRETE IN EARTH: Where trench excavation is used, and where sides of excavations are cut neatly in good, firm soil, side-forms may be omitted.

END OF SECTION 03 10 00

SECTION 03 20 00 - CONCRETE REINFORCEMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS: Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to work of this Section.

1.2 SCOPE:

A. Related Work Specified Elsewhere:

1. Concrete Formwork (Section 03 10 00)
2. Adhesive Concrete Anchors (Section 03 25 00)
3. Cast-In-Place Concrete (Section 03 30 00)

B. Work Included in this Section: Reinforcement for cast-in-place concrete (including bars, welded wire fabric, ties, and supports) as shown on drawings, and as specified herein.

1.3 QUALITY ASSURANCE:

A. References: Some products and execution are specified in this section by reference to published specifications or standards of the following (latest edition, with respective abbreviations used):

American Concrete Institute (ACI)

The American Society for Testing and Materials (ASTM)

American Welding Society (AWS)

Concrete Reinforcing Steel Institute (CRSI)

B. Standard References:

1. The current edition of the following standard references shall apply to the work of this section. Suffixes indicating date of issue are omitted from reference numbers used in the text of this section.

2. Publications of the American Concrete Institute:

ACI-301 "Specification for Structural Concrete for Buildings."

ACI 315 "Manual of Standard Practice for Detailing Reinforced Concrete Structures.

ACI 318 "Building Code Requirements for Reinforced Concrete."

3. Publications of the AWS:

AWS D1.4 "Recommended Practice for Welding, Reinforcing Steel, Metal Inserts, and Connections in Reinforced Concrete Construction."

4. Publications of the CRSI:

"Manual of Standard Practice"

5. Publications of the ASTM:

ASTM A-82 "Specification for Cold Drawn Steel Wire for Concrete Reinforcement."

ASTM A184 "Specification for Steel Bar Mats for Concrete Reinforcements."

ASTM A185 "Specification for Welded Steel Wire Fabric for Concrete Reinforcement."

ASTM A615 "Specification for Deformed Billet-Steel Bars for Concrete Reinforcement."

ASTM A706 "Specification for Low-Alloy Steel Deformed and Plain Bars for Concrete Reinforcement."

C. Building Code: North Carolina State Building Code, current edition with all amendments.

1.4 SUBMITTALS:

A. LEED Submittals:
1. Product Data: For products having recycled content, documentation including percentages by weight of postconsumer and preconsumer recycled content. Include statement indicating cost for each product having recycled content.
2. Product Data: For products being extracted, harvested or recovered, as well as manufactured, within 500 miles of the project site. Include statement indicating cost for each product considered as a regional material.

B. Shop Drawings:

1. Shop drawings shall be in accordance with ACI 315.
2. Only shop drawings checked and stamped "Approved by Contractor" will be accepted for review.
3. Show details, bar clearances, notes, and necessary information for placing of reinforcing steel.
4. Show wall and pier reinforcing in elevation. Include all pertinent details and schedules required to specify the reinforcing. Show welding requirements for welded bars.

5. Submit reinforcing shop drawings for review. Shop drawings shall include, but not be limited to, reinforcing layout, size location, quantities, lap lengths, required bends and other pertinent information related to the installation of the reinforcing steel.

C. Welding Certificates.

1.5 DELIVERY, STORAGE, HANDLING:

A. Reinforcing steel shall be delivered to project site properly tagged, bundled, and ready to place.

B. Reinforcing steel and welded wire mesh delivered to project site (and not immediately placed in forms), shall be protected from mud, excessive rust-producing conditions, oil, grease, or distortion.

PART 2 - PRODUCTS

2.1 MATERIALS:

A. Recycled Content of Steel Products: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 90 percent.

B. Regional Materials: Products to be used in the creation of the concrete mixes for the project shall be extracted, harvested or recovered, as well as manufactured, within 500 miles of the project site. Provide a minimum of 20 percent of the products that qualify as Regional Materials.

C. Reinforcing Bars: New, deformed bars, conforming to ASTM A615- S1, Grade 60 as required on drawings. ASTM A706 for bars in welded applications.

D. Welded Wire Fabric: Welded wire fabric shall be electrically-welded, wire fabric of cold-drawn wire, of gauge and mesh as shown on drawings, or as required. Fabric shall conform to ASTM A185, Grade 60 or Grade 70. Provide in mat form.

E. Plain Smooth Dowels: Plain smooth dowels shall conform to ASTM A306 with a minimum yield stress of 40,000 psi.

F. Tie Wire: Shall be 16 gage, or heavier, black annealed, steel wire.

G. Accessories: Fabricate accessories from concrete, metal, plastic, or other materials accepted by the Engineer. Include spacers, ties, chairs, bolsters, and other devices required to properly support, space, and secure the reinforcing steel in its proper position in accordance with the Drawings and recommendations of the CRSI "Manual of Standard Practice". Chairs and other accessories shall be Class I or Class II in accordance with CRSI. Parts in contact with exposed concrete surfaces shall be either stainless steel (AISI 302 or 304) or have plastic coated legs. Locations and types of accessories shall be shown on the shop drawings. Chairs for all concrete reinforcing steel to be supported on soil shall be continuous high chairs with continuous longitudinal wires, or individual square plates, welded

to the bottom of the chair legs. Use "Z" spacer bars between adjacent vertical reinforcing mats in walls. Use standees between top and bottom mats of reinforcing in footings.

2.2 FABRICATION:

A. Reinforcing steel shall be fabricated to shapes and dimensions indicated on drawings, and in compliance with applicable provisions of ACI 315 and ACI 318.

B. Bars shall be bent cold in shop. No bars shall be bent in field, unless specifically indicated on drawings.

C. Tolerances: Bars used for concrete reinforcement shall meet the following requirements for fabricating tolerances:

1. Sheared length: + one inch.
2. Stirrups and ties: + one-quarter inch.
3. All other bends: + one inch

D. Fabrication of reinforcing steel prior to review and approval of shop drawings by Project Engineer shall be solely the responsibility of the Contractor.

PART 3 - EXECUTION

3.1 GENERAL REQUIREMENTS FOR REINFORCING:

A. Reinforcing shall be free from scale, loose rust, mud, or coatings which will reduce bond to concrete.

B. Bars with kinks or bends not shown on drawings shall not be placed. Heating of reinforcement for bending or straightening will not be permitted.

C. Minimum concrete cover for reinforcing shall be as shown on drawings and per ACI 318 standards, but otherwise shall comply with the following:
1. 3" for concrete poured directly against the earth.
2. 2" for formed surfaces exposed to earth or weather.
3. 1" for formed slab or wall surfaces not exposed to weather.

3.2 PLACING OF REINFORCEMENT:

A. Tolerances: Bars shall be placed to the following tolerance: + one-quarter inch.

B. Dowels: Place steel dowels as required on drawings by means of plywood templates. Place and anchor dowels securely before placing concrete.

C. Accessories:

1. Nails shall not be driven into formwork to support reinforcement. Turn tie wires into concrete, not toward exposed surfaces.

2. Space bar supports in accordance with ACI 315, ACI 301, and CRSI Manual of Standard Practice. Chairs for reinforcing steel to be supported on soil shall be spaced as necessary to prevent the legs from pressing into the soil, but no more than 5'-0" on center.
3. In walls, provide continuous slab bolsters spaced at 4'-0" o.c. maximum to support reinforcing off formwork. Use #4 "Z" spacer bars at 4'-0" o.c. each way between wall mats.

D. Securing Reinforcement:

1. Reinforcing bars shall be supported and wired together to prevent displacement by construction loads, or by placing of concrete, beyond tolerances as set forth hereinbefore.
2. Maintain metal reinforcement securely and accurately in place until concrete is placed.
3. Any and all disturbances of reinforcement from any cause whatsoever shall be corrected fully prior to placing of concrete. Damaged bar-supports and spacers shall be repaired or shall be removed and replaced.
4. Bars shall not be bent after being embedded in hardened concrete, unless indicated so on drawings.
5. When approved, welding of reinforcing steel shall conform to AWS D1.4. Do not weld at bend in a bar. Welding of cross bars shall not be permitted unless authorized by Project Engineer.

3.3 SPLICES OF REINFORCEMENT:

A. Splices and offsets in reinforcements shall not be made at points of maximum stress.

B. Splices shall be approved by Engineer. Splices shall provide sufficient lap to transfer required stress.

C. Character and design of each splice shall conform to requirements of ACI 318, Class B Tension laps, unless otherwise specifically noted on the drawings.

3.4 FIELD QUALITY CONTROL:

A. Inspection of Placement of Reinforcing Steel:

1. Project Engineer shall be given advanced notice of not less than 24 hours prior to placing concrete to allow inspection of reinforcing steel.
2. Inspection of placement of reinforcement in a section will be made only after placement is complete for that section to be poured.
3. Such inspections shall not relieve Contractor of his responsibility to provide work in accordance with requirements of contract documents. Such inspections are for purpose of minimizing errors in field work.

END OF SECTION 03 20 00

SECTION 03 25 00 - ADHESIVE ANCHORS

PART 1 - GENERAL

1.1 SECTION INCLUDES:

A. Furnishing and installing adhesive anchors as dowels or with washers and nuts into holes drilled into the existing cast-in-place concrete members as indicated on the drawings and as specified herein.

B. Equipment required for drilling the holes and for locating the existing embedded reinforcing steel.

C. Equipment required for mixing, proportioning and dispensing the adhesive into holes drilled for adhesive anchors.

D. Identifying and locating existing reinforcing steel with magnetic equipment, pilot holes, or other means prior to drilling holes for anchors.

E. Items of testing, quality control, and evaluation of in-place adhesive anchors.

1.2 RELATED SECTIONS SPECIFIED ELSEWHERE:

A. Cast In Place Concrete (Section 03 30 00)

1.3 QUALITY ASSURANCE:

A. References: Some products and execution are specified in this section by reference to published specifications or standards of the following (latest edition, with respective abbreviations used):

American Society for Testing and Materials (ASTM)

American Institute of Steel Construction (AISC)

American Concrete Institute (ACI)

B. Standard Specifications and Codes: The following latest edition of the specification and codes form a part of this specifications where reference is made to a specific paragraph or section of the specific standard or code:

ACI 503.1 "Standard Specification for Bonding Hardened Concrete, Steel, Wood, Brick, and Other Materials to Hardened Concrete with a Multi-Component Epoxy Adhesive"

ACI 318 Building Code Requirements for Reinforced Concrete

ACI 349 Appendix 'B' "Steel Embedments"

ASTM E488 "Standard Test Methods for Strengths of Anchors in Concrete and Masonry"

C. Building Code: North Carolina State Building Code

1.4 SUBMITTALS:

A. LEED Submittals:

1. Product Data: For epoxy and other adhesive anchoring systems, documentation including printed statement of VOC content.

B. Submit test results performed by an Independent Testing Laboratory certifying tensile, bond, and shear strength of anchors specified herein or shown on the contract drawings. Tests of anchors shall be made on nearly identical materials, embedment lengths, and conditions indicated on the drawings. Tests shall be made in accordance with ASTM E488 "Standard Test Methods for Strength of Anchors in Concrete and Masonry".

C. Anchors acceptable for use on this project shall meet or exceed the load test data as required by the Contract Drawings.

D. Submit copies of the manufacturer's written instructions for installation of the adhesive anchors specified.

E. Submit type of equipment to be used for drilling the holes in the concrete for the adhesive anchors, and procedures for drilling and preparation of the holes for receiving the adhesive anchors.

F. Submit type of equipment to be used for proportioning, mixing, and dispensing the adhesive.

G. Certification that the adhesive will not be affected by the alkalinity of the cement and that there is no shrinkage of the adhesive, and that the creep coefficients are insignificant.

1.5 QUALIFICATIONS:

A. Manufacturer:

Source: Adhesive for bonding the anchors into the existing concrete shall be of one manufacturer unless specifically noted otherwise herein.

B. Installer Training: Conduct a thorough on-site training with the manufacturer or the manufacturer’s representative for the contract on the project. Anchors installed prior to completion of the training will be rejected and subject to load testing at contractor’s expense or removal and replacement. Training to consist of a review

of the complete installation process for each type of epoxy embedded anchor types, to include but not limited to:

1. Hole drilling procedure
2. Hole preparation & cleaning technique
3. Adhesive injection technique & dispenser training / maintenance
4. Anchor preparation and installation
5. Proof loading/torquing

C. Certifications: Unless otherwise authorized by the Engineer, anchors shall have one of the following certifications:

1. ICBO ES Evaluation Report indicating conformance with current applicable ICBO ES Acceptance Criteria.
2.. ICC ES Evaluation Report

1.6 PRODUCT HANDLING:

A. Delivery and Storage: Deliver all materials of this section to the job site in original unopened containers with all labels intact. Store only under conditions recommended by the manufacturer. Do no retain on the job site any material that has exceeded the shelf life recommended by the manufacturer.

B. Replacement: In the event of damage, replace as necessary to the approval of the Engineer at no additional cost to the Owner.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS: Only products of the following manufacturer will be acceptable for use on this project when approved by the Engineer and the results of all tests on products proposed by the manufacturer meets all the requirements of these specifications:

A. DeWalt – Formally Powers Fasteners of New Rochelle, NY

B. Hilti of Tulsa, OK

C. Simpson Strong-Tie of Pleasanton, CA

2.2 MATERIALS:

A. Anchor Rods and Dowels:

1. Anchor rods shall be stainless steel manufactured from steel conforming to ASTM F593 (AISI 304), unless otherwise noted on the drawings. Anchor rods shall have minimum depth of embedment as indicated on details. Anchor rods shall have threads for their full length.

2. Dowels shall be the same material as anchor rods or reinforcing steel as specified on the Contract Drawings.

B. Nuts and Washers: Nuts shall be manufactured from steel conforming to ASTM F594. All washers and nuts shall conform to ANSI B18.22.1 (1965) Type A plain.

C. Adhesive Injection Gel: shall be a two-component solvent-free, moisture-insensitive, creep resistant paste epoxy bonding agent for bonding rigid materials exposed to sustained loads and/or high ambient temperatures.

1. Quality Control: Quality control tests are required on each lot of adhesive supplied under this specification.

a. Testing: All tests shall be conducted using the test methods prescribed in Sections 2.0 and 3.0.

b. Tests: The actual quality control tests to be performed in accordance with ASTM standards and the manufacturer's written instruction.

c. Certification and Test Report: Manufacturer shall certify that every batch of material supplied to this specification meets all of the requirements of Sections 2.0 and 3.0.

2. Labeling, Packaging, Storage:

a. Labeling Information: The label shall include, in a clear and distinct manner, the following information:

(1) Product name and lot number

(2) Health hazard warnings, precautions or handling and recommended first aid procedures in cast of contact

(3) Mix ratio by volume

(4) Directions for use

b. Packaging: The adhesive material shall be packaged in new, sealed containers. Each container will be clearly labeled.

c. Storage: The material shall be stored in its original sealed containers at a temperature not below 32^{o}F or above 90^{o}F for a period not to exceed 1 year. If these limits are exceeded, the material shall be retested prior to use to determine conformance to this specification. The expense of any retest shall be borne by the purchaser.

D. Drilling Equipment: Per manufacturer written instructions specific to the type of anchoring and adhesive system being used for the appropriate conditions.

E. Equipment for Dispensing:

1. Bulk Mix and Dispensing:

a. Type: The equipment used to meter and mix the two injection adhesive components and inject the mixed adhesive into the hole or void shall be portable, positive displacement type pumps with interlock to provide positive ratio control of exact proportions of the two components at the nozzle. The pumps shall be electrically powered to supply the logic controller and air powered to drive the individual pumps, and shall provide in-line mixing.

b. Operating Pressure: Air input pressure from compressor is limited to 100 psi maximum. Pump shall have a 50 to 1 mechanical advantage ratio, thus giving up to 5000 psi discharge pressure when input pressure reaches 100 psi. Face shields and gloves are mandatory for operator of pump during operation of pump. 40 psi is standard operating pressure of compressor. At higher temperatures, line pressure can be reduced.

c. Ratio Tolerance: The equipment shall have the capability of maintaining the volume ratio for the injection adhesive prescribed by the manufacturer of the adhesive within a tolerance of + 5% by weight at any volume delivery and discharge pressure. Pump shall be adjustable ratio from 1:1 to 3:1 within 5% accuracy by weight.

2. Hand Mix and Dispensing:

a. Mixing: Measuring and mixing for small quantity dispensing may be accomplished by measuring correct amounts of adhesive components into a container and mixing as directed by the adhesive manufacturer.

b. Dispensing: Properly mixed adhesive shall be loaded into a bulk caulking gun and dispensed into the holes. The nozzle of the caulking gun shall be long enough to begin dispensing the adhesive into the hole beginning at the bottom or rear of the hole.

PART 3 - EXECUTION

3.1 PROJECT EXAMINATION:

A. Prior to the installation of any adhesive anchors, the Contractor shall examine the site and all concrete surfaces and members to receive the anchors and identify conditions which adversely affect the execution of the work. Prior to beginning this

work, the manufacturer of the epoxy shall provide instructions and technical assistance to the personnel installing the anchors on the procedures for drilling and installing the anchors. Unless waived by the Engineer based upon demonstrated past experience in epoxy anchor installation, this instruction shall be on site. **Only a contractor or subcontractor who has been trained and approved by the epoxy manufacturer will be permitted to install the adhesive anchors on this project.**

B. Do not proceed with work until all unsatisfactory conditions have been corrected and the personnel have been properly trained on drilling and installing the anchors.

3.2 HOLES FOR ANCHORS:

Locating Holes: All holes shall be accurately located and as near as possible to the location shown on the contract drawings to miss the existing reinforcing steel. Where holes have to be shifted due to job conditions more than 1" from the location shown or closer than 1" from the edge of the steel plate connection or angle, notify the Engineer.

3.3 EXECUTION OF THE WORK:

A. Drilling of Holes: All holes shall be drilled using only the manufacturer recommended and approved equipment to the specified depth and diameter recommended by the manufacturer for the size of anchor specified. Use a depth gage to drill hole to the specified depth. Holes shall be clean with minimal side wall residue. All holes shall be thoroughly clean of all dust, debris, and other bond inhibiting contaminants using methods and procedures recommended by the manufacturer. Holes shall be cleaned using oil-free compressed air and nylon brushes. Holes shall be approved prior to installing the adhesive gel.

B. Unless waived by the Engineer, all holes shall be inspected and approved by the Engineer or a representative of the testing laboratory/Special Inspector prior to the installation of the anchor. Acids shall not be permitted for cleaning.

C. After cleaning, adhesive and anchor bolts shall be placed immediately to prevent contamination of the concrete and metal.

D. Holes that are drilled and abandoned shall be filled with a moisture insensitive epoxy mortar. Where exposed, tint the epoxy mortar to match the mortar color of the adjacent surfaces.

E. Dispensing of adhesive shall begin at bottom or back of hole or void. Upon filling the hole with adhesive, the adhesive shall displace the fitting and pipe nozzle from the hole, without travel of adhesive past the fitting.

F. Anchor rod holes shall be filled to half to three-quarters the depth of the hole to ensure full depth contact of adhesive and anchor rod.

G. Placing of the anchor rod should be done with one continuous stroke. Rotate the anchor or dowel as it is placed to ensure that all surfaces will be in intimate contact

with the adhesive. The anchor or dowel shall not be moved back and forth, as this will entrap air, as does excessive turning of the anchor.

H. Once the anchor rod is installed, wooden shims or bent wire shims shall be placed below the bolt to keep it centered in the hole. In addition to shimming, use other approved means to keep it centered in the back of the hole.

3.4 FIELD QUALITY CONTROL:

A. Testing: 5% of each type and size of drilled-in anchor shall be proof loaded by an independent testing laboratory. Testing of the anchors shall be performed prior to installation of other work attaching to or around the anchors. Adhesive anchors shall not be torque tested unless otherwise directed by the Engineer. If any of the tested anchors fail to achieve the specified torque or proof load within the limits as defined on the Drawings, all anchors of the same diameter and type as the failed anchor shall be tested, unless otherwise instructed by the Engineer. The cost of these additional tests shall be borne by the Contractor.

1. Torque shall be applied with a calibrated torque wrench.

2. Proof loads shall be applied with a calibrated hydraulic ram. Displacement of adhesive and capsule anchors at proof load shall not exceed D/10, where D is the nominal anchor diameter.

3.5 CURING: Curing for all anchors shall be as recommended by the manufacturer for the environmental condition at the time the anchor is installed.

3.6 WORKMANSHIP: Remove and replace any anchor that does not meet all the requirements of these specifications at no additional cost to the Owner.

END OF SECTION 03 25 00

SECTION 03 30 00 - CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SCOPE:

Section includes cast-in-place concrete as shown on drawings, as specified herein and as required to complete this work, including formwork, reinforcement, concrete materials, mixture design, mixing, transporting, placing, finishing, curing, quality control, quality assurance and property evaluation for the following.

1. Slabs on grade.
2. Foundations.
3. Building walls and piers

B. Related Work Specified Elsewhere:

1. Concrete Formwork (Section 03 10 00)
2. Concrete Reinforcement (Section 03 20 00)
3. Adhesive Anchors (Section 03 25 00)

1.3 DEFINITIONS:

A. Cementitious Materials: Materials conforming to this specification and have cementing value when used in concrete either by themselves, such as portland cement, other hydraulic cements or blended hydraulic cements, or such materials in combination with fly ash, other raw or calcined natural pozzolans, silica fume and/or slag cement.

B. Concrete: Mixture of cementitious materials, aggregates and water, with or without fibers or chemical admixtures, as required by this specification.

1.4 INDUSTRY STANDARDS:

A. Some products and execution are specified in this section by reference to published standards of the following:

American Concrete Institute (ACI)

American Society for Testing and Materials (ASTM)

American Welding Society (AWS)

Concrete Reinforcing Steel Institute (CRSI)

National Ready-Mix Concrete Association (NRMCA)

1.5 MANDATORY REFERENCED STANDARDS:

A. When referenced in text, standards and codes applying to this work shall conform to the latest version. Suffixes indicating date of issue are omitted in text.

B. Work on this project shall conform to all requirements of the following documents, published by the American Concrete Institute, Farmington Hills, except as specifically modified by these Contract Documents. Where conflicts arise between mandatory references, the more stringent requirement shall apply. Suffixes indicating date of issue are omitted elsewhere in text.

ACI 117-06 Specifications for Tolerances for Concrete Construction and Materials

ACI 301-05 Specification for Structural Concrete – Sections 1-5

ACI 305.1-06 Specification for Hot-Weather Concreting

ACI 306.1-90 Standard Specification for Cold-Weather Concreting

ACI 308.1-98 Standard Specification for Curing Concrete

1.6 SUBMITTALS:

A. Submittals are to include information required by MANDATORY REFERENCE STANDARDS in addition to information below.

B. Product Data and MSDS: For each type of product indicated.

C. Design Mixtures:

1. For each concrete mixture, submit the proposed mixture design with information necessary to support conformance to these specifications. Submit alternate design mixtures at no additional cost to the owner, when characteristics of materials, Project conditions, weather, test results, material availability, design expiration per these documents or other circumstances warrant adjustments or re-design.
2. Submit third party fresh and hardened concrete testing results demonstrating conformance of the mixture to this specification.
3. Submit material certificates, material quality control information and samples per this specification.
4. Indicate ranges of admixtures for production concrete and amounts of mixing water to be withheld for later addition at Project site (if approved by Engineer)

D. LEED Submittals:

1. Product Data: For products having recycled content, documentation including percentages by weight of postconsumer and preconsumer recycled content. Include statement indicating cost for each product having recycled content.

2. Product Data: For products being extracted, harvested or recovered, as well as manufactured, within 500 miles of the project site. Include statement indicating cost for each product considered as a regional material.
3. Product Data: For liquid floor treatments and curing and sealing compounds, documentation including printed statement of VOC content.
4. Design Mixtures: For each concrete mixture containing fly ash as a replacement for Portland cement or other potential cement replacements, and for equivalent concrete mixtures that do not contain Portland cement replacements.

E. Concrete Production Field Quality Control Reports (Submitted monthly to Engineer):

1. Submit material certificates, field quality control information and samples per this specification.

F. Steel Reinforcement Shop Drawings: Refer to Section 03 20 00.

G. Construction Joint Layout: Indicate proposed construction joints required to construct the structure, if not otherwise indicated on the drawings.

1. Location of construction joints is subject to approval of the Engineer.

H. Samples: For concrete materials, collected in accordance with ASTM C 183 and ASTM D 75, if requested by the Engineer.

I. Qualification Data: For installers, manufacturers, producers and testing agencies.

J. Material Certificates: For each of the following, signed by manufacturers demonstrating conformance to applicable standards and this specification:

1. Cementitious materials.
   a. Report alkali contents for supplementary cementitious materials.
2. Admixtures
   a. To include compatibility statements for each admixture to document appropriateness for use with other constituents.
3. Aggregates
4. Waterstops.
5. Curing compounds.
6. Floor and slab treatments.
7. Bonding agents.
8. Adhesives.
9. Vapor retarders.
10. Semirigid joint filler.
11. Joint-filler strips.
12. Repair materials.

K. Material Test Reports: For the following, from a qualified testing agency, indicating compliance with requirements (as necessary to satisfy requirements for each individual mixture design proposed for the work):

1. Historical and current quality control test records for cementitious materials and aggregates.
2. Aggregate testing data and indicating absence of deleterious expansion of concrete due to alkali aggregate reactivity for all mixtures.

L. Quality Control Plan, Plan of Action

And Quality Control Records

M. Minutes of pre-installation conference

N. Repair procedures

O. Floor surface flatness and levelness measurements to determine compliance with specified tolerances, if requested.

P. Indicate proposed construction joints required to construct the structure.

Q. Samples of concrete materials collected in accordance with ASTM C 183 and ASTM D 75, if requested.

1.7 QUALITY ASSURANCE:

A. Superintendant: Qualified superintendant with at least 5 years experience with similar types of concrete placements.

B. 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.

C. Cementitious Materials Testing Agencies: Testing for cementitious materials as part of the quality control plan and for material certification must be conducted by agencies that have participated in the reference sample and laboratory inspection programs of Cement and Concrete Reference Laboratory (CCRL). Proof of participation and current involvement is required.

D. Concrete 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."

E. Testing Agency Qualifications: An independent agency, qualified according to ASTM C 1077 and ASTM E 329 for testing indicated.

1. Personnel conducting field tests shall be qualified as ACI Concrete Field Testing Technician, Grade 1, according to ACI CP-1 or an equivalent certification program.
2. Personnel performing laboratory tests shall be ACI-certified Concrete Strength Testing Technician and Concrete Laboratory Testing Technician - Grade I. Testing Agency laboratory supervisor shall be an ACI-certified Concrete Laboratory Testing Technician - Grade II.
3. Laboratory testing for hardened concrete other than compressive strength testing shall be a firm specializing in the specific test(s).

F. Source Limitations: Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant, obtain aggregate from single source, and obtain admixtures from single source from single manufacturer.

G. Comply with the Mandatory Reference Standards Above unless modified by requirements in the Contract Documents:

H. Concrete Testing Service: Engage a qualified independent testing agency to perform material evaluation tests and to design concrete mixtures.

I. Pre-installation Conference:

1. At least 15 days before submitting design mixtures, hold a pre-construction conference to review the design mixture and detailed procedures for ensuring quality of concrete material and proper concrete construction. Provide a detailed quality control plan for procedures and testing meeting the requirements of these specifications. Record detailed minutes of the meeting and distribute to all parties in attendance within five (5) days. Require representatives of each entity directly concerned with cast-in-place concrete to attend, including the following:

    a. Contractor's superintendents.
    b. Independent testing agency responsible for concrete design mixtures.
    c. Independent testing agency responsible for field quality assurance testing.
    d. Ready-mix concrete manufacturer.
    e. Concrete subcontractor.
    f. Special concrete finish subcontractor
    g. Reinforcing installers
    h. Designer
    i. Special Inspector
    j. Other involved parties

2. Review Quality Control Plan

1.8 CONTRACTOR QUALITY CONTROL

A. The Contractor must implement a quality control plan:

1. Contractor shall designate persons or third party to perform quality control. Testing shall be done by persons qualified per these specifications.
2. Procedures
    a. Special inspection and testing and inspecting agency procedures for field quality assurance, contractor quality control, concrete finishes and finishing procedures, curing procedures, construction contraction and isolation joints, and joint-filler strips, semirigid joint fillers, forms and form removal limitations, shoring and reshoring procedures, anchor rod and anchorage device installation tolerances, steel reinforcement installation, concrete repair procedures, concrete protection, workforce, placement logistics and contingencies for equipment failures or inclement weather, material transportation to site, verification of subcontractor and producer work and/or materials.
3. Production Testing
    a. Frequency for testing to verify fresh concrete property conformance in production shall be included in the Quality Control Plan. Quality control records shall be submitted.
4. Concrete Production Facilities

a. Provide plan and records for demonstrating conformance to ASTM C 94 and must have current NRMCA "Certification of Ready Mixed Concrete Production Facilities" for the batch plant and fleet.

5. Cementitious Materials
   a. Mill certifications must be current and contain all standard and optional compositional and physical data (per associated ASTM standard) demonstrating conformance. Cementitious Materials Producer quality control testing frequency must be daily (maximum) unless otherwise approved by the Engineer and shall demonstrate compliance with specifications. The general procedures for testing and reporting shall follow ASTM C 1451 or other approved method.
   b. Historical mill certifications and producer quality control/uniformity records for specified properties (per the applicable ASTM standard) of all cementitious materials for a period dating from the time of design to six months prior to design.
   c. Mill certifications and producer quality control/uniformity records for all cementitious materials.
6. Aggregates
   a. Quality control testing must be at a frequency no greater than daily for coarse and fine aggregate cleanliness (ASTM C 117) and coarse aggregate grading (ASTM C 136) and twice per day for fine aggregate gradation (ASTM C 136). The general procedures for testing and reporting shall follow ASTM C 1451 or other approved method. Sampling locations shall be detailed in the quality control plan and shall represent conditions in the mixture.
   b. Method and frequency of moisture content testing shall be detailed in the quality control plan. In-line moisture meters for fine aggregate, if used, must be calibrated at least once per shift, minimum. Moisture content of coarse aggregates must be tested at least once per day or when conditions change. Fine aggregates must be tested once every four (4) hours minimum, or when conditions change.
   c. Include contingency procedures for adverse weather conditions at stockpiles and methods to maintain consistency in materials.
   d. Historical aggregate quality control data demonstrating conformance to specifications for a period dating from the time of design to six months prior to design.
   e. Quality control data for coarse and fine aggregates during construction.
   f. Quality control plan for use of non-standard aggregate gradations if appropriate.
7. Concrete Design Trial Mixtures and Production Mixtures
   a. Records of all concrete trials and placements showing exact location of placement, date and time of placement, site-specific environmental conditions during placement, including relative humidity, air temperature and wind speed as required in these specifications, quantity of placement, class of concrete placed, curing temperatures, verification of moist curing measures and other quality control records. Submit mandatory and optional batch ticket information listed in ASTM C 94 Section 13 for each concrete batch. Provide clear indication of materials added to the concrete mixture.
   b. Indicate ranges of admixtures for production concrete and amounts of mixing water to be withheld for later addition at Project site (if approved by Engineer)

1.9 DELIVERY, STORAGE, AND HANDLING:

A. All materials to be stored per manufacturer's written requirements and in a manner to prevent contamination, damage, or degradation.

PART 2 - PRODUCTS

2.1 MANUFACTURERS:

A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:

1. Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, products specified.
2. Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, manufacturers specified.

2.2 CONCRETE MATERIALS:

A. Regional Materials: Products to be used in the creation of the concrete mixes for the project shall be extracted, harvested or recovered, as well as manufactured, within 500 miles of the project site. Provide a minimum of 20 percent of the products that qualify as Regional Materials.

B. Cementitious Material: Use the following cementitious materials, of the same type, brand, and source, throughout Project unless approved in writing by the Engineer:

1. Portland Cement: ASTM C 150, Type II or Type I/II, gray,low Alkalai. Use Type V gray, if indicated or directed when concrete is in contact with sulfate in soil or water. The following supplemental cementitious materials are permitted for use:
   a. Supplementary Cementitious Materials (SCM's):
      1) Fly Ash: ASTM C 618, Class F. Loss on ignitions (LOI) shall not be greater than 3% and shall not vary by more than +/- 1%. Fly ash shall meet the optional physical requirements of ASTM C 618. Historical ASTM C 1451 uniformity records for a period of at least six months prior to design and throughout construction from the producer must demonstrate conformance.
      2) Slag Cement: ASTM C 989, Grade 80 or Grade 100. Slag cement shall not qualify as Grade 120 unless permitted by the Engineer in writing.
      3) Silica Fume: ASTM C 1240, including optional physical uniformity requirement.
      4) Other SCM's conforming to ASTM C 618 may be submitted for evaluation.

2. Blended Hydraulic Cement: When permitted, ASTM C 1157 Cement Type GU, MS, MH, or ASTM C 595, Type IS, portland blast-furnace slag, Type IP, portland-pozzolan cement, or Type IL, Portland-limestone cement. Conform to maximum supplementary cementitious materials content in the blended cement provided in ACI 301 if exposed to deicing salts.

C. Aggregates: Provide individual aggregates from a single source throughout the project. Each source shall be individually stockpiled and handled in a manner to minimize segregation. Provide service record data of at least 10 year's satisfactory service in similar application and service conditions

using similar aggregates and cementitious materials. Aggregate sources that exhibit potential for alkali-silica reactivity with proposed cementitious materials shall not be used. Provide documentation that one of the two following criteria are met, as tested by a qualified third party laboratory on a representative sample of each aggregate source:

1. ASTM C 1260 mortar bar expansion is less than 0.13 percent at 28 days
2. ASTM C 1567 mortar bar expansion with job cementitious materials is less than 0.13 percent at 28 days. ASTM C 1567 to be used only if the sodium oxide equivalent alkalis are less than 4 percent in supplementary cementitious materials. Alternative approved methods to be used if requirement not met.

D. Normal-Weight Aggregates: ASTM C 33 coarse and fine aggregates, Class 4M coarse aggregate or better, graded, unless otherwise permitted. Use Class 5M coarse aggregate for architectural concrete, as specified, unless otherwise permitted by the Engineer. Aggregate certification is valid for 90 days from the date of testing. Quality control records for gradation and cleanliness shall not exceed ASTM C 33 limits more than once in five consecutive tests prepared for quality control, except that the fine aggregate fineness modulus shall not deviate more than 0.2 from the base fineness modulus per ASTM C 33 for any test.

1. Nominal maximum size of coarse aggregate. Nominal maximum sizes indicated in mixture design requirements shall be used, provided that requirements of ACI 301 are met:
2. Fine Aggregate shall conform to the specific sieve analysis limits of ASTM C 33 Section 6 unless otherwise permitted. Fine aggregates shall be clean, sharp, natural and free from loam, clay, lumps or other deleterious substances.
3. The gradation limits of ASTM C 33 may be waived at the discretion of the Engineer provided that it can be demonstrated that a more optimal gradation is achieved and gradation control can be maintained. Intermediate sized aggregates may be used. Documentation of optimization should include Individual Percent Retained Chart, Coarseness Factor Chart, 0.45 Power Curve, and dry-rodded unit weight testing. Submit information to show method used and plan for quality control if alternate gradations are used.

E. Water: ASTM C 94 and potable, or ASTM C 1602.

F. Fly ash shall be obtained from one source for the concrete delivered to the project. Fly ash may be allowed to replace up to 40% of the cement by weight. If Fly ash is used, a minimum of 20% percent of fly ash, by weight of cement, shall be used to replace cement.
1. Fly ash is not permitted in concrete placed subject to cold weather placement procedures (ASTM C306).
2. Fly ash will not be permitted for concrete exposed to the weather or the exterior, or concrete mixes with entrained air. Except where air content is measured and verified (by the appropriate ASTM Standard Test Method) to be within specified tolerances for each truck immediately prior to placement and as approved by

architect. The coordination and cost of such testing shall be the contractor's responsibility except as approved by the owner. Concrete not conforming to the requirements of the specifications shall be rejected.

2.3 ADMIXTURES:

A. All admixtures shall be used in strict conformance with manufacturer's written requirements. Manufacturer(s) must certify that admixtures are compatible with other constituents in mixture. Admixtures shall be used as indicated in drawings, permitted by the Engineer, or necessary for design, as applicable. All admixtures are subject to approval by the Engineer.

B. Air-Entraining Admixture: Air entraining admixture shall conform to ASTM C 260. The Contractor shall submit an alternative if appropriate due to compatibility issues with other admixtures.

C. 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. All admixtures shall be non-corrosive and contain only trace amounts of deleterious halides. All admixtures shall be from a single source unless otherwise permitted by the Engineer.

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.
7. Accelerating or Water-Reducing and Accelerating Admixtures: ASTM C 494 Type C or E, respectively, shall be non-chloride, non-corrosive, and only used if permitted by the Engineer in writing.

D. Set-Accelerating Corrosion-Inhibiting Admixture: Commercially formulated, anodic inhibitor or mixed cathodic and anodic inhibitor; capable of forming a protective barrier and minimizing chloride reactions with steel reinforcement in concrete and complying with ASTM C 494/C 494M, Type C. Use only if permitted by the Engineer in writing.

1. Products: Subject to compliance with requirements:

a. BASF Construction Chemicals - Building Systems; Rheocrete CNI.
b. Grace Construction Products, W. R. Grace & Co.; DCI.
c. Sika Corporation; Sika CNI.

E. Non-Set-Accelerating Corrosion-Inhibiting Admixture: Commercially formulated, non-set-accelerating, anodic inhibitor or mixed cathodic and anodic inhibitor; capable of forming a protective barrier and minimizing chloride reactions with steel reinforcement in concrete. Use only if permitted by the Engineer in writing. Available products that may be incorporated into the Work include, but are not limited to, the following:

1. Products: Subject to compliance with requirements:

a. BASF Construction Chemicals - Building Systems; Rheocrete 222+.
b. Grace Construction Products, W. R. Grace & Co.; DCI-S.
c. Sika Corporation; FerroGard 901.

F. Specialty admixtures including shrinkage-reducing admixtures (SRA), alkali-silica reaction inhibiting admixtures (ASRIA), viscosity-modifying admixtures (VMA) and durability Enhancing Admixtures (DEA) must have data documenting their effectiveness and compatibility with other admixtures, have a proven field history with similar job materials and be approved by the Engineer.

1. Self-Consolidating concrete (SCC): High-range water reducing admixture shall conform to ASTM C 494 Type F (or ASTM C 1017 Type I), be polycarboxylate-based, and appropriate for use in SCC, as indicated by the manufacturer.

2.4 CURING MATERIALS:

A. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. when dry, clean and free of materials injurious to cement or concrete or that will mar the surface. Burlap shall be stored dry and rinsed with clean water prior to application.

B. Moisture-Retaining Cover: ASTM C 171, 10- mil polyethylene film or white burlap-polyethylene sheet. Use black when required per ACI 308.1

C. Water: Clean, potable and non-chloride bearing.

D. Curing Compounds shall not be used unless permitted in writing by the Engineer. If permitted, the type with supporting documentation and proposed area shall be submitted to the Engineer for review. If used at an area to receive coating or adhered membrane, compound must be certified by manufacturer to not interfere with bonding of floor covering.
1. Clear, Waterborne, Non-staining, Membrane-Forming Curing Compound with Fugitive Dye: ASTM C 309, Type 1-D, Class B
2. Clear, Waterborne, Non-staining, Membrane-Forming Curing and Sealing Compound: ASTM C 1315, Type II, Class A.
3. White, Waterborne, Non-staining, Membrane-Forming Curing and Sealing Compound: ASTM C 1315, Type II, Class A.

2.5 RELATED MATERIALS:

A. Expansion- and Isolation-Joint-Filler Strips: ASTM D 1751, asphalt-saturated cellulosic fiber or ASTM D 1752, cork or self-expanding cork. Do not place asphaltic materials in contact with PVC, separate with EPDM.

B. Semirigid Joint Filler: Two-component, semirigid, 100 percent solids, epoxy resin with a Type A shore durometer hardness of 80, or aromatic polyurea with a Type A shore durometer hardness range of 90 to 95 per ASTM D 2240.

C. Bonding Agent: ASTM C 1059, Type II, non-redispersible, acrylic emulsion or styrene butadiene.

D. Epoxy Bonding Adhesive: ASTM C 881, two-component epoxy resin, capable of humid curing and bonding to damp surfaces, of class suitable for application temperature and of grade to suit requirements, and as follows:

1. Types IV and V, load bearing, for bonding hardened or freshly mixed concrete to hardened concrete.

E. Reglets: Fabricate reglets of not less than 0.0217-inch- thick, galvanized steel sheet. Temporarily fill or cover face opening of reglet to prevent intrusion of concrete or debris.

F. Dovetail Anchor Slots: Hot-dip galvanized steel sheet, not less than 0.0336 inch thick, with bent tab anchors. Temporarily fill or cover face opening of slots to prevent intrusion of concrete or debris.

G. Waterstops:
1. Flexible Rubber Waterstops: CE CRD-C 513, with factory-installed metal eyelets, for embedding in concrete to prevent passage of fluids through joints. Factory fabricate corners, intersections, and directional changes.
   a. Profile: Flat dumbbell with center bulb
   b. Dimensions: 6 inches by 3/8 inch thick nontapered.
2. Chemically Resistant Flexible Waterstops: Thermoplastic elastomer rubber waterstops with factory-installed metal eyelets, for embedding in concrete to prevent passage of fluids through joints; resistant to oils, solvents, and chemicals. Factory fabricate corners, intersections, and directional changes.
   a. Profile: Flat dumbbell with center bulb
   b. Dimensions: 6 inches by 3/8 inch thick nontapered.
3. Flexible PVC Waterstops: CE CRD-C 572, with factory-installed metal eyelets**,** for embedding in concrete to prevent passage of fluids through joints. Factory fabricate corners, intersections, and directional changes.
   a. Profile: Flat dumbbell with center bulb
   b. Dimensions: 6 inches by 3/8 inch thick nontapered.

H. Vapor Retarders
1. Sheet Vapor Retarder: ASTM E 1745, Class A, 10 Mil minimum thickness, unless otherwise noted on the drawings. Include manufacturer's recommended adhesive or pressure-sensitive tape.

2.6 REPAIR MATERIALS:

A. Repair Materials shall have documentation to show compatibility with substrate materials, shall be specially formulated and proportioned for the specific use, and shall provide a durable repair. Conform with ACI 301.

2.7 CONCRETE MIXTURES, GENERAL:

A. Prepare design mixtures for each type of concrete, proportioned on the basis of laboratory trial mixture or field test data, or both, according to ACI 301. Submit written reports of each proposed mix for each class of concrete prior to start of work to document that requirements have been met. Include up to date sieve analyses and

concrete strength tests. Do not begin concrete production until mixes have been reviewed and approved by the Engineer.

1. Concrete mixture designs shall be considered valid for 183 days from the date of trial batching. Mixtures shall be re-certified through testing prior to concrete placement after the expiration date.

2. Use a qualified independent testing agency for preparing and reporting proposed mixture designs based on laboratory trial mixtures.

3. Unless otherwise noted or permitted by the Engineer, strength requirements shall be based on 28-day compressive strength tests in accordance with ACI 301.

4. Required compressive strength of the design mixture shall be based on statistical methods or laboratory trial requirements to exceed the specified concrete compressive strength. All other required hardened concrete properties specified for design shall be based on actual test values.

5. Design mixes shall be proportioned using the maximum specified slump and within 3 ^{o}F of the maximum temperature to be used during production. Trials used to prepare specimens for mixture qualification shall be completed with full scale trucks with at least 5 cubic yards of concrete and in a manner similar to that expected during production. Material proportions for the trial shall be used as the basis for tolerances in production. Method of placement shall be considered and accounted for in developing the mixture design.

6. If a self-consolidating concrete mixture is proposed for use, the Contractor must submit the mixture design, appropriate documentation for fresh concrete properties and stability and hardened concrete stability for review. An on-site program must be proposed for quality control.

B. Cementitious Materials: Conform to ACI 301. Use fly ash, pozzolan, ground granulated blast-furnace slag, silica fume or other supplementary cementitious materials as needed to achieve required properties.
   1. Limit percentage, by weight, of cementitious materials other than Portland cement in concrete as follows:
      a. Fly Ash: 20 percent minimum (if using), 40 percent maximum.

C. Limit acid-soluble, chloride-ion content in hardened concrete to 0.08 percent by weight of cement.

D. Admixtures: Use admixtures according to manufacturer's written instructions. Do not use admixtures that have not been incorporated and tested in the accepted mixtures, unless otherwise authorized by the Engineer in writing.

   1. Use water-reducing, high-range water-reducing or plasticizing admixtures in concrete, as required, for placement and workability.
   2. Use water-reducing and retarding admixture when required by high temperatures or other adverse placement conditions.
   3. Use corrosion-inhibiting admixture in concrete mixtures where indicated.
   4. Do not use accelerating admixtures unless permitted by the Engineer in writing.
   5. Use of admixture is subject to approval by the Engineer.

E. Air entraining admixtures shall be used for all concrete potentially exposed to freezing and thawing or subjected to hydraulic pressure.

1. Entrained air shall be 6% +/- 1.5%. The water cement ratio for all concrete exposed to freezing and thawing shall not exceed 0.45.

2.8 SLUMP:

A. Concrete shall be proportioned to have a specified slump of 4" at point of placement (with applicable tolerances) unless otherwise permitted. Requests shall be submitted to the engineer. Lower or higher values may be used if indicated by the Contractor and the Contractor can demonstrate the mixture can be well placed and consolidated during the mock-up without segregation.

B. Concrete containing high range water reducers shall have at least 2" of initial slump prior to addition of high range water reducing admixture. Slump shall not at any time exceed 8" after addition of admixtures, unless otherwise approved. All admixtures shall be added at the plant unless otherwise permitted in writing by the Engineer. Only if permitted, the addition of the high range water reducer shall be by a truck mounted mechanical dispenser or by a qualified certified concrete technician of the concrete supplier. The admixture shall not be manually dispensed by the concrete truck driver. After the addition of the high range water reducer, the concrete shall be rotated at maximum speed for a minimum of three minutes (45 revolutions minimum). The contractor must demonstrate that concrete properties are not adversely affected by on-site addition. Specific quality control measures must be proposed by the Contractor.

C. Concrete containing water reducers, other than high range water reducers, shall have a maximum slump of 6 inches and a minimum slump of 3".

2.9 CONCRETE MIXTURES FOR SITE ELEMENTS:

A. Foundations for Building (Spread Footings and Wall Footings): Proportion structural normal weight concrete as follows:
1. Nominal Maximum Size Coarse Aggregate: 3/4-inches.
2. Minimum Design Compressive Strength, f'c (ASTM C 39): 3000 psi at 28 days (provide applicable data to substantiate the chosen required f'cr)
3. Maximum Water-Cementitious Materials Ratio: 0.50
4. Air Content at Point of Placement (ASTM C 173): 3 percent max
5. Maximum Allowable Slump at Point of Placement (ASTM C 143): 4" min, 6" max
   a. Exception: see requirements for addition of high range water reducer for concrete to be pumped into place.

B. Interior Slab-on-Grade and Column Piers: Proportion structural normal-weight concrete as follows:
1. Nominal Maximum Size Coarse Aggregate: 3/4-inches.
2. Minimum Design Compressive Strength, f'c (ASTM C 39): 4000 psi at 28 days (provide applicable data to substantiate the chosen required f'cr)
3. Maximum Water-Cementitious Materials Ratio: 0.50
4. Air Content at Point of Placement (ASTM C 173): 3 percent max
5. Maximum Allowable Slump at Point of Placement (ASTM C 143): 4" min, 6" max

a. Exception: see requirements for addition of high range water reducer for concrete to be pumped into place.

C. Exterior Exposed Concrete: Proportion structural normal-weight concrete as follows:
1. Nominal Maximum Size Coarse Aggregate: 3/4-inches.
2. Minimum Design Compressive Strength, f'c (ASTM C 39): 4000 psi at 28 days (provide applicable data to substantiate the chosen required f'cr)
3. Maximum Water-Cementitious Materials Ratio: 0.45
4. Air Content at Point of Placement (ASTM C 173): 6 percent +/- 1.5%
5. Maximum Allowable Slump at Point of Placement (ASTM C 143): 4" min, 6" max
   a. Exception: see requirements for addition of high range water reducer for concrete to be pumped into place.

D. All other structural concrete, including equipment pads:
1. Nominal Maximum Size Coarse Aggregate: 3/4-inches.
2. Minimum Design Compressive Strength, f'c (ASTM C 39): 4000 psi at 28 days (provide applicable data to substantiate the chosen required f'cr)
3. Maximum Water-Cementitious Materials Ratio: 0.5
4. Air Content at Point of Placement (ASTM C 173): 3 percent max (non-air entrained)
5. Maximum Allowable Slump at Point of Placement (ASTM C 143): 4" min, 6" max
   a. Exception: see requirements for addition of high range water reducer for concrete to be pumped into place.

2.10 CONCRETE MIXING:

A. Batching: Concrete shall be mixed at central batch plants or truck-mixed at central batch plants and transported to the site as specified herein, unless otherwise permitted. Concrete production facilities and delivery fleet must comply with the requirements of ACI 301 and must have current NRMCA batch plant and fleet certification. Plants must have sufficient capacity to produce concrete of the quantity and quality as specified herein. All plant facilities are subject to inspection by the Engineer or his Agent. Plants must be routinely inspected by the ready-mix producer to verify that the plant is in conformance with ASTM C 94 and that scales and measures are accurate. The batchman shall have clear view of material addition and admixture measures during batching. Trucks shall be routinely inspected for hardened concrete on fins and worn fins. Information shall be submitted as part of the quality control records.

B. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C 94 and ASTM C 1116 (if applicable), and furnish batch ticket information, including non-standard information in ASTM C 94 Section 13. During hot weather or under conditions contributing to rapid setting of concrete, a shorter mixing time than specified in ASTM C 94 will be required as follows, unless otherwise permitted:

1. When air temperature is between 81 and 89.9 deg F, reduce mixing, delivery and placement time from 1-1/2 hours to 1 hour.
2. When air temperature is 90 deg F or above, reduce mixing, delivery and placement time to 45 minutes.

C. Concrete batches shall be 3 yds^3 minimum. Tolerances for scale.

D. Concrete delivered to the project with slump greater than the maximum specified shall be rejected. Slumps that are less than the specified may be increased by adding water to the mix to bring the mix to the specified slump, provided the following conditions are met:

1. The specified water to cementitious materials ratio is not exceeded.
2. The batch ticket indicates the amount of water withheld from the mix so that the design water-cement ratio is not exceeded.
3. No high-range water reducing admixtures have been added at the job-site.
4. Any water that is added to mix is done in the presence of the Engineer or the owner's testing agent.
5. The amount of water added is documented and provided to the architect.
6. The amount of water added does not exceed 3 gallons of water per yard of concrete.
7. Slump and air content tests are made after the water is added.
8. Written approval is provided by the concrete supplier.

E. Ice, if used, shall be potable, subject to the same requirements of water and accurately measured for addition into the mixer within the tolerances of ASTM C 94.

F. Water shall not be added to structural concrete at the jobsite unless permitted by the Engineer.

G. Maintain equipment in proper operating condition, with drums cleaned before charging of each batch. Wash water shall be fully discharged prior to beginning a new batch unless permitted by the Engineer and optional tests per ASTM C 94 are performed at a frequency of at least once per week. Schedule delivery of trucks in order to prevent delay of placing after mixing.

H. Maximum concrete temperature at point of placement is 90 ^{o}F or 3 ^{o}F greater than that used in design unless otherwise permitted.

PART 3 - EXECUTION

3.1 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."
2. Install reglets to receive waterproofing and to receive through-wall flashings in outer face of concrete frame at exterior walls, where flashing is shown at lintels, shelf angles, and other conditions.
3. Install dovetail anchor slots in concrete structures as indicated.
4. Do not embed any foreign items in concrete. Do no embed aluminum unless indicated. Do not embed conduit unless indicated.

3.2 JOINTS:

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

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

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. Except where indicated to be unbonded, roughen surfaces of hardened concrete at all vertical construction joints. Clean surface of laitance, coatings, loose particles, and foreign matter to expose aggregate.
3. Form keyed joints as indicated. Embed keys at least 1-1/2 inches into concrete. Provide keyways in all construction joints in footings in walls and at junctions of walls and footings.
4. 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.
5. Locate horizontal joints in walls and columns at underside of floors, slabs, beams, and girders and at the top of footings or floor slabs.
6. Space vertical joints in walls as shown and no more than 36 times the wall thickness. Locate joints beside piers integral with walls, near corners, and in concealed locations where possible.
7. At joints between foundation systems and walls, and elsewhere, unless otherwise specified herein, dampen, but do not saturate, the roughened and cleaned surface of set concrete immediately before placing fresh concrete. Use an approved bonding agent at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces in accordance with manufacturers requirements only if directed or indicated.

C. 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.

3.3 PREPARATION OF EQUIPMENT AND PREPARATION OF PLACE OF DEPOSIT:

A. Before placing concrete, all equipment for mixing and transporting and placing concrete shall be cleaned, all debris and ice removed from spaces to be occupied by the concrete, forms thoroughly cleaned of soil, ice, or other coatings which will prevent proper bond, reinforcement shall be securely tied in place and expansion joint material, anchors, and other embedded items shall be securely positioned.

B. Semi porous subgrade shall be sealed in an approved manner.

C. Hardened concrete and foreign materials shall be removed from the conveying equipment. All equipment shall be checked for potential areas of contamination to the concrete during placement from abrasion or breaches in liquid conduits.

D. Before placing concrete, the formwork installation, reinforcing steel, and items to be embedded or cast in must be complete. Notify other crafts involved in ample time to permit the installation of their work; cooperate with other trades in setting such work, as required. Notify Engineer upon completion of installation of all reinforcing in ample time to permit inspection of the work.

E. At slabs on grade, restore any damaged subgrade areas to specified density immediately prior to installation of slab subbase. Lab verify specified compaction. Install underslab membrane over compacted stone. Provide another layer of membrane over any punctures or tears, lapping sealing edges as prescribed for sheet joints. Turn up membrane at edges of all slabs, unless otherwise detailed.

F. Soil at bottom of all foundation systems shall be inspected by a testing laboratory. Place concrete immediately after approval of foundation excavations and installation of reinforcing, etc.

3.4 CONCRETE PLACEMENT:

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

B. Do not add water to concrete during delivery, at Project site, or during placement unless approved by the Engineer.

C. Concrete shall be handled from the mixer to the place of final deposit as rapidly as practical by methods which will prevent separation or loss of ingredients and in a manner which will assure that quality concrete is installed.

D. Conveying equipment shall be of size and design to insure a continuous flow of concrete at the delivery end.

E. Use approved tremies for vertical placements unless otherwise permitted. Do not allow concrete to freefall distances that may cause segregation.

F. Screed concrete which is to receive other construction to the proper level to avoid excessive skimming or grouting.

G. Do not use concrete which has become non plastic and unworkable or does not meet the required quality control limits, or which has become contaminated by foreign material. Do not use concrete that is non-uniform or contains lumps or balled material. Remove rejected concrete from the project site and dispose of in an acceptable location.

H. 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 in a manner to avoid inclined construction joints. Deposit concrete as nearly as possible to its final location to avoid segregation. Do not subject concrete to any procedure that will cause 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. Consolidate in a manner to avoid segregation.
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 into preceding layer. Do not insert vibrators into lower layers of concrete that have set. 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.
4. For mass concrete, as indicated by the Engineer, deposit concrete in forms in horizontal layers not deeper than 24".

I. 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.

J. Remove temporary spreaders in forms when concrete placing has reached the elevation of such spreaders.

K. Bring surface of slabs to the correct elevations with a straight edge and strike off. Use bull floats or darbies to smooth the surface, leaving it free of humps and hollows. Do not sprinkle water on the plastic surface. Do not work bleed water or sprinkled water into the surface. Do not disturb the surface prior to beginning the finish operation.

L. Pumped concrete shall be appropriately proportioned so that concrete properties do not drastically change through the pump. The pumping operations shall not create segregation or otherwise negatively affect the concrete. Comply with the following:

1. Concrete pumps shall be positive piston type pumps. No squeeze pumps will be permitted.
2. Concrete contaminated with pumping aids shall be discarded. Priming mixtures not in conformance with these specifications shall be discarded.
3. Fresh concrete testing shall be conducted at the point of placement when the concrete is pumped.
4. The submitted concrete mix design shall indicate that the mix is designed to be pumped. Once mix designs are approved, changes in the mix to accommodate pumping shall be prohibited unless new mix designs are submitted for approval.

M. Surface moisture evaporation rate of exposed concrete surfaces during placement and prior to implementation of moist curing measures shall be maintained below levels described herein. Use equipment and determine evaporation rate of exposed concrete surfaces in accordance with ACI 305.1.

3.5 COLD WEATHER PLACEMENT:

A. 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.
4. Do not place concrete when temperature is 40°F and falling, and when freezing weather is predicted within 24 hours unless protective measures are in place to provide adequate curing environment as outlined below
5. High early strength (Type III) cement shall not be used.

B. Thaw subgrades to six inches prior to placement. Demonstrate that subgrade is thawed with calibrated thermometer. All materials in contact with fresh concrete shall be above freezing at the time of placement unless otherwise permitted.

C. In addition to laboratory cured test specimens, additional concrete test specimens shall be cured under field conditions as required and directed by the Engineer to check the adequacy of curing and protection of the concrete.

D. Adequate equipment shall be provided for heating the concrete material and protecting the concrete during the cold weather length of protection shall be that time specified for curing. Maintain a minimum placement temperature and protection temperature surrounding the concrete during the entire curing period as specified in ACI 306.1. Record temperature once every 6 hours to demonstrate compliance.

E. Slabs and other members are to be covered with insulated blankets or other suitable protection method per ACI 308.1. Supplement with external heating as required. Provide tented, heated areas surrounding concrete walls. Heaters which exhaust gases that contain carbons are not allowed except that indirect-fired heaters (that exhaust outside the enclosure) shall be permitted. Ensure that heat is spread evenly. Do not overheat individual areas or create excessive thermal gradients.

3.6 HOT WEATHER PLACEMENT:

A. Hot-Weather Placement: Comply with ACI 301 and protect all concrete work from physical damage or reduced strength which could be caused by high ambient temperature, solar radiation, low humidity, or wind in compliance.

1. Maintain concrete temperature below 80 °F at time of placement unless otherwise permitted. Chilled mixing water or chipped 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. Keep forms and areas in contact with concrete continuously moist during curing.

B. Cool reinforcing by wetting sufficiently so that the steel temperature will not exceed the ambient air temperature immediately before placing concrete. Use an approved admixture designed to retard the rate of set as necessary. Admixtures shall be tested in the design mix prior to use. Admixtures shall not contain any chlorides.

C. Prompt curing shall be exercised. The use of evaporation retarders is prohibited unless otherwise permitted by the Engineer. Fogging used prior to application of final moist curing measurers shall be done with an atomizing fogger; all exposed surfaces must be continuously fogged and surfaces must not be allowed to dry.

D. The concrete supplier shall make provision for cooling concrete materials as necessary to meet specifications. Aggregates shall be uniformly moistened in stockpiles.

3.7 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 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.

D. Steel Pan Stairs: Provide concrete fill for steel pan stair treads, landings, and associated items. Cast-in inserts and accessories as shown on Drawings. Screed, tamp, and trowel-finish concrete surfaces.

E. Concrete in earth: Where trench excavation is used, and where sides of excavations are cut neatly in good, firm soil, side-forms may be omitted.

3.8 FINISHING FORMED SURFACES:

A. 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 class B limits for formed-surface irregularities.

1. Apply to concrete surfaces only where not exposed to public view.

B. Smooth-Formed Finish: As-cast concrete texture imparted by form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams. Repair and patch tie holes and defects. Remove fins and other projections that exceed class A limits on formed-surface irregularities.

1. Apply to concrete surfaces to receive a rubbed finish, or to be covered with a coating or covering material applied directly to concrete, such as waterproofing, dampproofing, painting or other similar system.

C. Rubbed Finish: Apply the following to smooth-formed finished as-cast concrete where concrete surface is exposed to public view:

1. Smooth-Rubbed Finish: Not later than one day after form removal, moisten concrete surfaces, perform necessary patching and rub with carborundum brick or another abrasive until producing a uniform color and texture. Do not apply cement grout other than that created by the rubbing process.

D. Related Unformed Surfaces: At tops of walls, horizontal offsets, and similar unformed surfaces adjacent to formed surfaces, strike off smooth and finish with a texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces, unless otherwise indicated.

3.9 FINISHING FLOORS AND SLABS:

A. General: Use industry accepted techniques for screeding, restraightening and finishing operations to comply with the requirements of these ACI 301 and these specifications. Guidance can be found in ACI 302.1R. Do not wet concrete surfaces. Do not overwork surfaces. Do not segregate concrete from overworking. Coordinate all concrete finishes with the Engineer and final finished surface manufacturer prior to implementation.

B. Scratch Finish: While still plastic, texture concrete surface that has been screeded and bull-floated or darbied. Use stiff brushes, brooms, or rakes to produce a profile amplitude of 1/4 inch in 1 direction.
1. Apply scratch finish to surfaces indicated and to receive concrete floor toppings and/or to receive mortar setting beds for bonded cementitious floor finish, as required by the manufacturer or as indicated.

C. Float Finish: Consolidate surface with power-driven floats or by hand floating if area is small or inaccessible to power driven floats. Floating shall begin when the water sheen has disappeared and when the surface has stiffened sufficiently to permit the operation. During or after the first floating, the plane of surfaces shall be checked with a left straight edge applied at not less than two different angles. Restraighten, cut down high spots, and fill low spots. Repeat float passes and restraightening until surface is left with a uniform, smooth, granular texture.

1. Apply float finish to surfaces indicated to receive trowel finish and/or to be covered with fluid-applied or sheet waterproofing, built up ort membrane roofing, or sand bed terrazzo, or as indicated.

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

1. Apply a trowel finish to surfaces exposed to view, to be covered with resilient flooring, linoleum, carpet, ceramic or quarry tile set over cleavage membrane, paint or another thin-film finish coating system, as required by the manufacturer, or as indicated.
2. For floor installations greater than 10,000 ft2, finish surfaces to the following tolerances, according to ACI 117 and ASTM E 1155 (ASTM E 1155M), for a randomly trafficked floor surface except as noted herein:
    a. Specified overall flatness FF (SOF)F and levelness FL (SOF)L with minimum values equal to 2/3 of the specified values, required for application of the specific coating or overlay to be coordinated with the specific trade.
    b. Moderately Flat as described in ACI 117 for exposed areas with minimum values equal to 2/3 of the specified values.
    c. Contractor shall be responsible for meeting or exceeding flatness and levelness requirements. Any slabs which do not meet these requirements are subject to removal and replacement at the Owner's discretion at no additional cost to the Owner.
3. For floor installations 10,000 ft2 or less and incidental areas, finish and measure surface so gap at any point between concrete surface and an unleveled, freestanding, 10-ft.- (3.05-m-) long straightedge resting on two high spots and placed anywhere on the surface does not exceed 1/4 inch (6 mm).

E. Trowel and Fine-Broom Finish: Apply a first trowel finish to surfaces indicated where ceramic or quarry tile is to be installed by either thickset or thin-set method or where indicated. While concrete is still plastic, slightly scarify surface with a fine broom.

1. Comply with flatness and levelness tolerances and methods for trowel finished floor surfaces.

F. Broom Finish: Apply a non-slip broom finish 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 Engineer before application.

G. Slip-Resistive Finish: Apply Slip-Resistive Finish to exterior concrete platforms, steps, and ramps, and elsewhere as indicated. Before final floating, apply slip-resistive aggregate or aluminum granule finish where indicated and to concrete stair treads, platforms, and ramps. Apply according to manufacturer's written instructions as indicated or directed and as follows:

1. Uniformly spread as indicated and not less than 25 lb/100 sq. ft. of dampened slip-resistive aggregate granules over surface in 1 or 2 applications. Tamp aggregate flush with surface, but do not force below surface.
2. After broadcasting and tamping, apply float finish.
3. After curing, lightly work surface with a steel wire brush or an abrasive stone and water to expose slip-resistive aggregate granules.
4. Curing: Wet cure for a period of seven days, minimum. Refer to other sections of specs.

H. Control Joints: Saw-cut slabs as soon as possible after finishing using a saw blade that has a triangular arbor configuration to reduce edge raveling or dislodging aggregates at

the following spacing to minimize slab curling and cracking. Refer to plans for control joint layout. Fill joints in accordance with Architectural drawings.

I. Finishing: Refer to the Architectural drawings and specifications for finishes. The finished concrete shall slab comply with the damage and stain prevention provisions specified in the diamond polishing concrete floors specification.

3.10 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 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.

D. Steel Pan Stairs: Provide concrete fill for steel pan stair treads, landings, and associated items. Cast-in inserts and accessories as shown on Drawings. Screed, tamp, and trowel-finish concrete surfaces.

E. Concrete in earth: Where trench excavation is used, and where sides of excavations are cut neatly in good, firm soil, side-forms may be omitted.

3.11 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 and ACI 305.1 for hot-weather or high evaporation protection during curing.

B. 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.

C. Unformed Surfaces: Begin curing immediately (within 10 minutes) after finishing concrete or when the surface is firm enough to resist marring. Implement fogging between finishing and application of final moist curing if final moist curing is delayed or evaporative conditions exist. Do not allow concrete to dry at any period after placement and during the curing period. Cure unformed surfaces including floors and slabs, concrete floor toppings, and other surfaces. Carefully apply curing measures so that surfaces are not marred.

D. Moist cure concrete according to ACI 308.1, unless otherwise permitted or required. Record daily high and low temperatures adjacent to the concrete. Standard curing shall be seven-day moist cure except as approved otherwise:

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

   a. Water.
   b. Clean absorptive cover, water saturated, and kept continuously wet. Cover shall be clean and premoistened with clean water for a period of at least 24 hours prior to placement, but shall be kept dry when not in use. Cover concrete surfaces and edges with 12-inch lap over adjacent absorptive covers. A moisture retaining cover (as described below), fogger, soaker hoses and/or sprinkler shall be used to maintain moist conditions. Method must be approved and demonstrated to provide continuously moist conditions. Practice cold and hot-weather concrete procedures per ACI 306.1, ACI 305.1 and ACI 301, as necessary. Water shall not be more than 20 ^{o}F cooler or warmer than the concrete. At slabs on grade prevent curing water from entering construction and control joints.

2. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches, and sealed by waterproof tape or adhesive. Immediately repair any holes or tears during curing period using cover material and waterproof tape. Moisture-retaining cover is to be used with absorptive cover above, unless permitted by the Engineer.

3. Curing and Sealing Compounds: Use of curing compounds is prohibited unless permitted by the Engineer and approved by coating or floor covering manufacturer and installer in writing if applicable. Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Maintain continuity of coating and repair damage during curing period.

   a. After curing period has elapsed, remove curing compound without damaging concrete surfaces by method recommended by curing compound manufacturer unless manufacturer certifies curing compound will not interfere with bonding of floor covering used on Project.

4. During the curing period, protect concrete from damaging mechanical disturbances including load stresses, shocks, excessive vibration, excessive thermal gradients, and from change caused by subsequent construction operations. Sequence placements such that influence from loading of adjacent spans does not create excessive bendings stresses and cracking.

3.12 JOINT FILLING:

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

1. Defer joint filling with semi-rigid sealants until concrete has aged at least six month(s), and preferably one year. Do not fill joints until construction traffic has permanently ceased.

2. Defer joint filling with flexible sealants for 60 days or as late as possible prior to installing floor finishes.

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

C. Install semi-rigid joint filler full depth in saw-cut joints and at least 1 inches deep in formed joints. Overfill joint and trim joint filler flush with top of joint after hardening.

D. Install flexible joint filler at least 1/2 inches deep in saw-cut joints and full depth in formed joints. Tool surface to provide full contact of sealant on sides of joint.

3.13 ARCHITECTURAL AND EXPOSED CONCRETE

A. Repair and cure damaged finished surfaces of cast-in-place architectural concrete when approved by Architect. Match repairs to color, texture, and uniformity of surrounding surfaces and to repairs on approved mockups.

B. Remove and replace cast-in-place architectural concrete that cannot be repaired and cured to Architect's approval.

C. Protect corners, edges, and surfaces of cast-in-place architectural concrete from damage; use guards and barricades.

D. Protect cast-in-place architectural concrete from staining, laitance, and contamination during remainder of construction period.

E. Clean cast-in-place architectural concrete surfaces after finish treatment to remove stains, markings, dust, and debris.

F. Wash and rinse surfaces according to concrete finish applicator's written instructions. Protect other Work from staining or damage due to cleaning operations.

G. Do not use cleaning materials or processes that could change the appearance of cast-in-place architectural concrete finishes.

3.14 CONCRETE SURFACE REPAIRS:

A. Complete repairs at defective areas as described herein unless otherwise directed. Inform Engineer of all patching and repairs. Submit material data sheets and procedures for repair for approval prior to implementing repairs.

B. Defective Concrete: Repair and patch defective areas as directed by and with approval of the Engineer. Remove and replace concrete that cannot be repaired and patched to Engineer's approval. If repair is not acceptable to the Architect, remove and replace defective concrete. Replace stained concrete that cannot be cleaned.

C. Patching Mortar: Mix dry-pack patching mortar, consisting of one part portland cement to two and one-half parts fine aggregate passing a No. 16 sieve, using only enough water for handling and placing, or use compatible prepackaged material, as required or approved. Patching materials shall be compatible with adjacent concrete and meet

strength and durability requirements of this specification. Bonding agents shall be as indicated in ACI 301 or as approved by the Engineer. Use materials appropriate for specific type of repair. If commercial bonding agents and/or pre-packaged materials are approved, bonding agent and repair must be applied in strict accordance with manufacturer's requirements. All repair materials are subject to approval by the Engineer and Architect.

D. 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. Repairs and materials shall be per ACI 301 and shall be completed immediately upon form removal, except that minimum repair depth is 1 inch.

1. Patch test areas at inconspicuous locations to verify mixture and color match before proceeding with patching.
2. Repair defects on concealed formed surfaces that affect concrete's durability and structural performance as determined by Engineer.

E. Repairing Unformed Surfaces: Repair surfaces in accordance with ACI 301. Test unformed surfaces, such as floors and slabs, for finish and verify surface tolerances specified for each surface. Correct low and high areas. Test surfaces sloped to drain for trueness of slope and smoothness; use a sloped template.

1. Repair finished surfaces containing defects. Surface defects include spalls, popouts, honeycombs, rock pockets, crazing and cracks in excess of 0.01 inch wide or that penetrate to reinforcement or completely through unreinforced sections regardless of width, and other objectionable conditions. Finish repaired areas to blend into adjacent concrete.
2. Repair defective areas, except random cracks and single holes 1 inch or less in diameter, by cutting out and replacing with fresh concrete. Remove defective areas with clean, square cuts and expose steel reinforcement with at least a 3/4-inch clearance all around. Dampen concrete surfaces in contact with patching concrete and apply bonding agent. Mix patching concrete of same materials and mixture as original concrete except without coarse aggregate or use approved compatible pre-packaged materials, as required. Place, compact, and finish to blend with adjacent finished concrete. Cure in same manner as adjacent concrete.
3. Repair random cracks and single holes 1 inch or less in diameter with patching mortar. Groove top of cracks and cut out holes to sound concrete and clean off dust, dirt, and loose particles. Dampen cleaned concrete surfaces and apply bonding agent. Place patching mortar before bonding agent has dried. Compact patching mortar and finish to match adjacent concrete. Keep patched area continuously moist for at least 72 hours.

F. Perform structural repairs of concrete, subject to Engineer's approval, using epoxy adhesive and patching mortar.

G. Repair materials and installation not specified above may be used, subject to Engineer's approval.

H. Fill in holes and openings left in concrete structures for the passage work by other trades, unless otherwise shown or directed, after the work of other trades is in place.

Mix, place, and cure concrete as herein specified, to blend with in place construction. Provide all other miscellaneous concrete filling shown or required to complete work.

I. Concrete work which does not conform to the specified requirements, including strength, tolerances, and finishes, shall be corrected as directed by the Engineer, at the Contractor's expense, without extension of time therefore. The Contractor shall also be responsible for the cost of corrections to any other work affected by, or resulting from, correction to the concrete work.

3.15 TESTING AND FIELD QUALITY ASSURANCE:

A. Testing and Inspecting: Owner will engage a special inspector and qualified testing and inspecting agency to perform field tests and inspections and prepare test reports.

B. Testing and Inspecting: Engage a qualified testing and inspecting agency to perform tests and inspections and to submit reports.

C. Inspections:

1. Steel reinforcement placement.
2. Steel reinforcement welding.
3. Headed bolts and studs.
4. Verification of use of required design mixture.
5. Concrete placement, including conveying and depositing.
6. Curing procedures and maintenance of curing temperature.
7. Verification of concrete strength before removal of shores and forms from beams and slabs.

D. Concrete Tests: Testing of composite samples of fresh concrete obtained according to ASTM C 172 shall be performed according to the following requirements:

1. Testing Frequency: Obtain one composite sample for each day's placement of each concrete mixture exceeding 5 cu. yd. (4 cu. m), but less than 25 cu. yd. (19 cu. m), plus one set for each additional 50 cu. yd. (38 cu. m) or fraction thereof.
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; ASTM C 173/C 173M, volumetric method, for structural lightweight 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. Unit Weight: ASTM C 567, fresh unit weight of structural lightweight concrete; one test for each composite sample, but not less than one test for each day's pour of each concrete mixture.
6. Compression Test Specimens: ASTM C 31/C 31M.
    a. Cast and laboratory cure two sets of two standard cylinder specimens for each composite sample.
    b. Cast and field cure two sets of two standard cylinder specimens for each composite sample.

7. 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.
8. When strength of field-cured cylinders is less than 85 percent of companion laboratory-cured cylinders, Contractor shall evaluate operations and provide corrective procedures for protecting and curing in-place concrete.
9. Cost for additional sets of lab or field cured compressive strength cylinders required by the contractor as back-up to demonstrate conformance or for form removal or other construction operations shall be incurred by the contractor.
10. 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).
11. Test results shall be reported in writing to Architect, concrete manufacturer, Engineer, 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.
12. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by Architect but will not be used as sole basis for approval or rejection of concrete.
13. Additional Tests: Testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Architect. Testing and inspecting agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C 42/C 42M or by other methods as directed by Architect.
14. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
15. Correct deficiencies in the Work that test reports and inspections indicate do not comply with the Contract Documents.

E. Measure floor and slab flatness and levelness according to ASTM E 1155 within 48 hours of finishing.

3.16 PROTECTION OF LIQUID FLOOR TREATMENTS

A. Protect liquid floor treatment from damage and wear during the remainder of construction period. Use protective methods and materials, including temporary covering, recommended in writing by liquid floor treatments installer.

3.17 WORKMANSHIP

A. Concrete work which does not conform to the specified requirements, including strength, tolerances, and finishes, shall be corrected as directed by the Engineer, at the Contractor's expense, without extension of time therefore. The Contractor shall

also be responsible for the cost of corrections to any other work affected by, or resulting from, correction to the concrete work.

END OF SECTION 03 30 00

SECTION 04 06 00
MASONRY MORTAR

PART 1: GENERAL

1.1 RELATED DOCUMENTS:

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to work of this Section.

1.2 SCOPE:

A. Related Work Specified Elsewhere:

1. Unit masonry (Section 04 20 00).
2. Through-wall flashing (Section 07 14 00).

B. Work Included This Section:

1. Mortar for masonry work and related work listed above and other work requiring the use of mortar.
2. All accessory materials and labor required for proper preparation and installation of mortar.

C. Mortar Requirements Specified Elsewhere: Mortar requirements specified in this Section apply generally to other Sections which require the use of mortar. However, mortar requirements included in other Sections shall take precedence over (for work of that particular section) any conflicting requirements of this Section.

1.3 INDUSTRY STANDARDS:

A. Some products and execution are specified in this Section by reference to published specifications or standards of the following (with respective abbreviations used). Reference is to the latest edition of the standard referenced.

- American Concrete Institute (ACI)
- American Society of Civil Engineers (ASCE)
- The American Society for Testing and Materials (ASTM)

1.4 SUBMITTALS:

A. Manufacturer's Data:

1. Submit manufacturer's printed test reports on premixed masonry/ mortar cement. Tests shall have been performed and reports prepared by an independent testing laboratory.

2. Submit manufacturer's printed technical data and mixing data for premixed masonry/ mortar cements.

3. Submit certification that the masonry/ mortar cements meet the specified requirements of ASTM C 91 or ASTM C1329.

4. Submit certification that masonry/ mortar cement meets compressive strength requirements of ASTM C270.

1.5 PRODUCT HANDLING:

A. Delivery:

1. Materials shall be delivered to the Project Site in manufacturer's original, unopened containers with manufacturer's brand name clearly marked thereon.

2. Containers shall show formulation of the mixture.

B. Storage: Store materials under cover in a dry place. Cement, lime and air-setting mortars shall be stored in watertight sheds with elevated floors. Protect cement from dampness to minimize warehouse set.

C. Aggregate: Stockpile in a manner that will prevent segregation of sizes and the inclusion of dirt and other foreign material.

1.6 QUALITY ASSURANCE:

A. Comply with ACI 530.1/ASCE 6 "Specifications for Masonry Structures" and requirements herein. In case of contradiction, the more stringent requirement shall govern. See Section 04 20 00 for additional requirements.

B. Hot and Cold-Weather Masonry Procedures: See Section 04 20 00.

C. Sand:

1. A representative sample of the job sand may be obtained and tested by an independent testing laboratory employed and paid for by the Owner.

PART 2: PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS:

A. Subject to compliance with the Drawings and Specifications, provide products by one of the following manufacturers, or equal approved in writing by the Architect:

- Lafarge Cement / Holcim Inc.
- Lehigh Cement / Heidelberg Materials
- Roanoke Cement / Titan American

B. Source: Products for use on this Project shall be of one manufacturer unless noted specifically otherwise.

2.2 MATERIALS:

A. Prepackaged Materials:

1. Cement shall be Portland Cement, Type I or II, meeting Standard Specifications for Portland Cement (ASTM C-150).

2. Hydrated Lime shall meet the requirements of the Standard Specification for Hydrated Lime for Masonry Purposes (ASTM C-207), Type S.

3. Hydraulic Hydrated Lime shall meet the requirements of the Standard Specification for Hydraulic Hydrated Lime for Structural Purposes (ASTM C-141).

4. Air Entraining Admixtures may be utilized and shall conform to ASTM C-260.

5. Accelerating Admixture:

a. Do not use any accelerating admixture without written approval of the Architect. The use of antifreeze is strictly prohibited in all cases.

b. In order for a proposed accelerating admixture to be considered by the Architect it shall comply with the following requirements:

Shall contain no calcium chloride or added chloride ions.

Shall be non-corrosive to ferrous metal.

Shall not decrease compressive strength or bond strength of the mortar.

Shall not cause efflorescence.

Shall comply with ASTM C 494, Type E.

c. Contractor shall submit with his accelerating admixture proposal a detailed description of the cold weather procedures regarding mixing and placing of mortar and protection of installed masonry that will be employed if the proposed accelerating admixture is used. These cold weather procedures shall be in accordance with the written instructions of the accelerating admixture manufacturer and shall be approved in writing by the Architect before the accelerating admixture can be used.

B. Sand shall meet the requirements of Standard Specifications for Aggregate for Masonry Mortar (ASTM C-144).

C. Water shall be potable.

2.3 PREPACKAGED MASONRY/ MORTAR CEMENTS: The masonry/ mortar cement to be used on the Project shall be in accordance with ASTM C91 or ASTM 1329 and meet the following minimum requirements.

A. Type S Mortar: The mortar made from the masonry/ mortar cement shall have a compressive strength of 1800 psi minimum at 28 days when tested in accordance with ASTM C-270, with maximum air volume of 16% and shall comply with all requirements of ASTM C 270 for Type S mortar.

B. Type N Mortar: The mortar made from the masonry/ mortar cement shall have a compressive strength of 750 psi minimum at 28 days when tested in accordance with ASTM C-270 with maximum air volume of 16% and shall comply with all requirements of ASTM C 270 for Type N mortar.

C. Instructions for mixing the mortar made from masonry/ mortar cement shall be published and accompany all shipments. The instructions shall be volumetric measurements and shall be developed to show proper proportions of sand to one (1) bag of the prepackaged masonry/ mortar cement with volume of water to produce a flow of the proper consistency.

D. Freeze-thaw resistance: The mortar shall comply with the following requirements when subjected to 50 cycles of the freeze-thaw test:

Loss of compressive strength	-	35% maximum
Loss in dry weight	-	1.0% maximum

The test specimen shall be made and tested in accordance with ASTM C 91 or ASTM 1329.

2.4 GROUT: Shall conform to ASTM C-476.

A. Fine Grout:

1 part Portland Cement
1/10 part hydrated lime
3 parts sand

B. Coarse Grout:

1 part Portland Cement
1/10 part hydrated lime
fine aggregate in the proportion of 2 1/4 to 3 times the sum of the volumes of cement and lime
coarse aggregate in the proportion of 1 to 2 times the sum of the volumes of cement and lime

2.5 MEASUREMENT AND MIXING:

A. The method of measuring materials shall be by volume and shall be such that the specified proportions of the mortar materials can be controlled and accurately maintained. A one cubic foot measuring device to make consistent volume measurements shall be used throughout the project. Measurement of sand by shovel shall not be permitted.

B. Mortar Mixer shall be a paddle-type mechanical mixer. It shall be of such design and size to accommodate the mix without overloading and be adequately powered to vigorously mix the ingredients.

C. The mortar mixer shall be charged in this order: add approximately one-half the water required, one-half the sand, the prepackaged masonry/ mortar cement, the remaining amount of sand, and then sufficient water to bring the mix to desired consistency. Mortar shall be mixed for a minimum of five minutes after all materials have been charged into the mixer with all batches being mixed to the same consistency.

D. After mortar has been placed on the mortar board it shall be retempered by adding water only one time prior to placing. After retempering one time, if the mortar becomes too stiff it shall be discarded. Mortar shall be used and placed in its final position within 1-1/2 hours after mixing. Mortar not used within 1-1/2 hours shall be discarded.

E. Admixtures:

1. Do not use any admixtures, including, air-entraining agents, accelerators, retarders, water repellent agents, anti-freeze compounds, or other admixtures, unless expressly specified in this Section of the Specifications and approved by the Architect or Engineer.

PART 3: EXECUTION

3.1 LOCATION:

A. The Contractor shall have the option of using Type S mortar at all locations if he so chooses rather than Type S and Type N at the specified locations.

1. Type S Mortar: Below grade and for structurally reinforced or load bearing masonry.

2. Type N Mortar: Above grade except where Type S is specified.

3. Fine Grout: Use in spaces less than 2” wide. See Section 03 30 00.

4. Coarse Grout: Use in spaces 2" or wider. See Section 03 30 00.

3.2 INSTALLATION:

A. Install as specified under Section 04 20 00 - Unit Masonry and other Sections of the Specifications.

END OF SECTION

SECTION 04 20 00
UNIT MASONRY

PART 1: GENERAL

1.1 RELATED DOCUMENTS:

A. Drawings and general provisions of Contract, including General and Supplementary General Conditions and Division 1 Specification Sections, apply to work of this Section.

1.2 SCOPE:

A. Related Work Specified Elsewhere:

1. Masonry mortar (Section 04 06 00).
2. Through-wall flashing (Section 07 65 10).
3. Light gauge metal framing backup for masonry (Section 05 40 00).
4. Rigid board insulation (Section 07 21 30).
5. Sealant work (Section 07 90 00).

B. Work Included This Section: Masonry work as shown on Drawings and as specified herein including all supplementary materials and accessories required for complete and proper installation of the work.

1.3 SINGLE LUMP SUM MASONRY SUBCONTRACT:

A. The work of this Section shall be bid and provided as a Single Lump Sum Sub-contract. Square foot/unit pricing of masonry labor and General Contractor furnished materials is not permitted.

B. The masonry subcontractor shall be a firm who specializes in masonry construction and shall furnish all materials, equipment and labor required to complete the required masonry construction for this Project.

C. The masonry subcontractor shall be bonded and shall not function as a broker but shall perform the work of this Section with its own forces. General Contractor shall provide on his letterhead (included with his bid) certification of bonding from the masonry subcontractor to be used on the Project.

D. Coordinate and provide all masonry work under the above requirements.

1.4 INDUSTRY STANDARDS:

A. Some products and execution are specified in this Section by reference to published specifications or standards of the following (with respective abbreviations used). Reference is to the latest edition of the standard referenced.

- American Society of Civil Engineers (ASCE)
- The American Society for Testing and Materials (ASTM)
- Brick Industry Association (BIA)

1.5 SUBMITTALS:

A. Submit certification by a nationally recognized testing lab that the brick to be provided complies with ASTM C 216 for the grade and type specified.

B. Masonry Cleaning Submittal: If high pressure water or sandblasting is proposed to be used to clean masonry, the Contractor shall submit written approval and recommended

procedures for such method from the masonry manufacturer. The recommended procedure shall be specific regarding types of nozzles allowed, spray velocity, sandblasting grit allowed, and other factors that relate to the resulting change in appearance or other characteristics of the masonry because of the cleaning. Do not begin cleaning of masonry using high pressure water or sandblasting prior to approval of this submittal by the Architect. See Paragraph titled "High Pressure Water and Sandblasting" in Part 3 of this Section for additional requirements.

C. Samples: Submit, for approval by the Architect, samples of face brick showing shape, dimensions, color, and texture. Samples shall be taken from lot proposed for use on the Project. Samples shall show color, texture and appearance range to be expected in masonry units delivered for the Project.

D. Procedures for Hot and Cold Weather Masonry Construction: Prior to installing any masonry during extreme hot or cold temperatures, the Contractor shall submit his proposed hot and cold weather masonry procedures to the Architect and shall have received the Architect's approval in writing of the procedures. Do not install any masonry during extreme hot or cold weather prior to written approval of these procedures by the Architect. See Paragraph "Environmental Conditions" in this Section for additional requirements regarding hot and cold weather masonry construction.

1.6 PRE-INSTALLATION MASONRY MEETING:

A. Prior to installation of any masonry work, the Contractor, Masonry Subcontractor, Architect, Owner and other involved subcontractors and material manufacturers or suppliers shall meet at the site. The Contractor shall schedule and conduct the meeting and shall give the Architect at least one week notice of the meeting date and time.

B. The purpose of the meeting will be to verify that all requirements of the Contract Documents will be complied with and that the facility is ready and in proper condition to receive the masonry work.

C. No masonry work is to be installed until it is assured that the work will be installed in accordance with the Contract Documents.

1.7 PRODUCT HANDLING:

A. Storage of Materials:

1. Masonry Units: Stack masonry units at site and avoid chipping. Protect masonry units from freezing and thawing. Keep masonry units covered to prevent soaking by rain.

2. Protect masonry units from wetting, staining, soiling and physical damage.

3. Reinforcement: Provide cover for reinforcement prior to use. Remove any loose rust, scale, dirt or other coatings that will reduce the bond by wire brushing prior to placement.

4. Portland cement, lime, and/or prepackaged masonry cements shall be delivered to the site and stored in unbroken bags or other approved containers. These materials shall be stored in dry, weather-tight sheds or enclosures with elevated floors, which will prevent the inclusion of foreign materials and damage by water or dampness. Masonry sand shall be delivered and stored in a manner to prevent inclusion of foreign material therein. Brick shall be delivered and stored on the job site on platforms or timbers, clear of the ground. Bricks which are chipped, cracked, broken, or marred in any other manner shall not be used where exposed to view.

1.8 ENVIRONMENTAL CONDITIONS:

A. Contractor's hot and cold weather procedures shall comply with ACI 530.1

1.9 PROTECTION:

A. Protect work against damage and keep top of walls covered with non-staining waterproof coverings when work is not in progress. Protect exterior masonry walls by covering walls up to a height of 30" above ground with 4 mil thick polyethylene or other suitable material.

1.10 QUALITY ASSURANCE:

A. Unless specifically shown otherwise on the Drawings or specified otherwise herein, all masonry work shall be installed in strict accordance with the printed instructions of the Brick Industry Association as documented in their Technical Notes, and other applicable Technical Notes for brickwork and the National Concrete Masonry Association's printed instructions for concrete masonry work. Copies are available from the referenced agencies.

B. Unit Masonry Standard: Comply with ACI 530.1/ASCE 6 "Specifications for Masonry Structures."

C. Inspecting Laboratory Qualifications: To qualify for employment in performing tests and inspection specified in this Section, an independent laboratory must demonstrate to Architect's satisfaction, based on evaluation of laboratory-submitted criteria conforming to ASTM C 1093, that it has the experience and capability to conduct satisfactorily the testing indicated without delaying the progress of the work.

D. Field Testing: As specified in Part 3 - Execution of this Section,

E. Fire Performance Characteristics: Where indicated, provide materials and construction identical to those of assemblies whose fire resistance has been determined per ASTM E 119 by a testing and inspection organization, by equivalent concrete masonry thickness, or by another means, as acceptable to authorities having jurisdiction.

F. Single Source Responsibility of Masonry Units: Obtain exposed masonry units of uniform texture and color, or a uniform blend within the ranges accepted for these characteristics, from one manufacturer for each different product required for each continuous surface or visually related surfaces.

PART 2: PRODUCTS

2.1 MATERIALS:

A. Face Brick:

1. Manufacturer:
   (a) **Commercial Wire Cut by Pine Hall Brick Company,** or equal approved by the Architect in writing. Color **Spektra Full Range**, unless otherwise noted in the drawings.

2. Size shall be 2 1/4" x 3 5/8" x 7 5/8" modular size. Special sizes and shapes shall be provided as indicated on the Drawings and as required by construction conditions.

3. Brick shall meet the requirements of ASTM C 216, Type FBS, Grade SW. Face brick shall be culled of chipped and cracked brick in accordance with the referenced ASTM Standard.

   a. Brick Length: In addition to complying with the length tolerance specified in "Table 4 - Tolerances on Dimensions" of ASTM C 216, it is requested that the brick manufacturer and supplier make a concentrated effort to either furnish all brick close to the specified nominal length dimension (i.e. 11 5/8" for utility brick) or furnish a mix of long and short brick with the allowed ASTM tolerance, such that the mason in the field can lay out a course of brick in the wall that will comply with dimensions shown on the Drawings without having to cut brick or install head joints that are outside of the specified dimension and tolerance for head joints (3/8" plus or minus 1/8"). This cannot be done when all brick are at or near the long side of the ASTM tolerance or when all brick are at or near the short side of the ASTM tolerance

4. Provide solid units where core holes would be visible in the finished work.

B. Anchors for Metal Stud/Brick Walls and Miscellaneous Locations:

1. Manufacturer:
   (a) **HB-213-2x Adjustable Veneer Anchor by Hohmann & Barnard**, **#2401 RJ-711 Adjustable Veneer Anchor by Wire-Bond**, or equal approved in writing by the Architect.

2. Provide at locations shown in the Drawings or required by construction conditions.

3. Anchors to be of 12 gauge by 7/8" wide steel and tie to be of 3/16" diameter steel, both hot-dip galvanized per ASTM A123.

4. Screws for attachment of anchor shall be self tapping NO. 10 x 1 1/4" with hex washer head and zinc plated. Do not use gypsum drywall screws.

C. Shelf Angles:

1. Shelf angles for brick veneer shall be 3 1/2" x 4" x 5/16" steel angle, unless shown otherwise on the Drawings, conforming to ASTM A 36 and galvanized in accordance with ASTM A 123.

D. Corrugated Metal Ties (only with prior approval by Architect) for anchoring brick veneer to building structure shall be not lighter than 22 gauge hot dipped galvanized per ASTM A123 steel 7/8" wide.

E. Metal Lath: Diamond mesh, expanded from copper alloy steel sheets, dip coated with rust inhibitive paint after expansion, weighing not less than 3.4 lbs. per sq. yd.

F. Masonry Cleaner: Prosoco Sure Klean 600, or approved equal. Cleaners shall be composed of detergents, wetting agents, buffering agents, and a maximum of 10% muriatic acid.

G. Weep Hole Ventilator: **QV - Quadro Vent by Hohmann & Barnard**, **#3601 Cell Vent by Wire-bond**, or equal approved in writing by the Architect. Weep hole ventilator to be plastic grid material of ultraviolet resistant polypropylene, 3/8" thick by 2 1/2" by 3 1/2" nominal dimensions. Provide color selected by Architect from full range of manufacturer's colors.

H. Control Joint: **VS Standard PVC Control Joint by Hohmann & Barnard**, **#2901 PVC Control Joint by Wire-bond**, or equal approved in writing by the Architect. Manufactured of polyvinyl chloride compound conforming to ASTM D 2287, Type PVC 654-4 with a

durometer hardness of 90 when tested in accordance with ASTM D 2240. See Section 07 90 00 for sealant materials required to caulk and seal the joint.

I. Through-Wall Flashing: As specified in Section 07 65 10. All flashing which extends through the wall and whose purpose is to divert penetrating water to the exterior of the wall shall be through-wall flashing as specified in Section 07 65 10.

J. Aluminum Brick Vents: **CA 168 by Hohmann & Barnard**, **Model "C" by Sunvent Industries** of Sylro Sales Corporation, or equal approved in writing by the Architect. Cast aluminum type, 7 3/4"h X 16 1/2"w X 4"d, with 18 X 14 mesh insect screen directly behind the louvers. Finish to be mill finish on exposed surfaces and bitumastic paint on surfaces to be in contact with masonry or concrete.

K. Mortar Net:(Provide mortar net even if not shown on the Drawings)

1. Manufacturer:
   (a) **1" MortarBreak DT by Advanced Building Products**, or equal approved in writing by the Architect.

2. Provide mortar net in the wall cavity directly above the thru-wall flashing in masonry exterior walls.

3. Mortar net is to be 1" thick by 10" height by 5' long sections and manufactured of high-density polyethylene fibers woven into a 3-dimensional grid. Mortar net dovetail shape prevents mortar droppings from forming a continuous dam, and its shape in combination with its 90% open weave configuration allows air and water rapidly and easily to move through the material of the product itself to the weep holes in the wall. Include the 5" high continuous bottom strip (of same thickness, material and construction as the mortar net) below the 5' sections of mortar net.

4. Where the wall cavity is wider than the 1" thick mortar net, fill excess space behind the mortar net with rigid insulation board of appropriate size and thickness such that the top of the insulation board is at least 6" above the top of the mortar net and the mortar net is held snug against the inside surface of the exterior wythe of masonry.

5. Installation of the mortar net, the continuous bottom strip, the rigid board insulation and other installation accessories shall be in accordance with published instructions of the mortar net manufacturer for the subject wall construction.

PART 3: EXECUTION

3.1 LAYING MASONRY:

A. Cutting of Units: Where cutting is necessary, make all cuts with a motor-driven masonry saw. Units with chips or irregular cuts will not be accepted. Should the Contractor observe variances in the color or texture of the approved decorative CMU or facing brick during installation, he shall immediately stop work and notify the Architect. Failure to follow this procedure may necessitate the removal of individual defective units or entire areas at the Contractor's expense.

B. Coursing: Masonry work is laid out on a nominal 3/8" uniformly wide joint. Work shall course vertically out as follows:

1. Brick Masonry: 3 courses in 8".

C. Lay masonry tight to interior door frames. Provide 1/4" to 3/8" space at jambs of exterior door frames to receive sealant.

D. Laying Brick Masonry:

1. Lay brick work plumb, level and true to line vertically and horizontally. Lay in running bond unless Drawings show other types of bond.

2. Head joints and bed joints shall be filled completely. Joints shall be uniform, approximately 3/8" wide.

3. Lay out work so no piece is less than 1/2 brick. Do not "tooth" to abutting walls; stack joint and rake out for caulking.

4. Joints shall be finished with metal tool to form a concave joint and to close hair line cracks and crevices.

5. Install weep holes in cavity walls as shown on Drawings. Unless shown otherwise on Drawings, install weep holes at 24" on centers, maximum, immediately above flashing to allow drainage. Weep holes shall be formed by installing the specified weephole ventilator in accordance with the manufacturer's written instructions.

6. Wetting of Brick:

   a. All brick shall be thoroughly wetted as necessary to reduce the rate of absorption of water at time of laying to not more than 0.7 of an ounce (20 grams) per minute per brick when placed on its flat side in 1/4 inch of water for one minute.

7. Brick Laying Technique:

   a. All joints between brick shall be filled with mortar. Brick shall be laid in a full, lightly furrowed bed of mortar with the head joints filled by placing sufficient mortar on the end of the brick so that when the brick is shoved into place, the head joint will be filled. Buttering of face edge and then slushing will not be permitted. All joints, both interior and exterior shall be cut flush.

8. Disturbed Units:

   a. Where bricks are disturbed or must be moved after the mortar has begun to lose its moisture, the brick and all adjacent mortar shall be removed and reset completely.

9. Tooling:

   a. All joints shall be tooled to a uniform concave joint, head joints first and then the bed joints. All joints shall be tooled at approximately the same degree of moisture content and firmness to achieve a uniform color and texture. New joiners will be required.

E. Horizontal Expansion Joints: Whenever brick veneer exceeds 30' in vertical height, horizontal shelf angles (expansion joints) shall be provided at locations shown on the Drawings, and if not shown on the Drawings at each floor level and in accordance with The Brick Industry Association Technical Note 18A. Ensure that the expansion joint is kept free of mortar and is left clear and open to be caulked and sealed as specified in Section 07 90 00, so that movement of the wall can occur without the masonry cracking.

F. Vertical Expansion Joints: Provide at locations shown on the Drawings and if not shown provide at not more than 24' on centers. If not shown on the Drawings, coordinate locations with the Architect for aesthetic reasons. Joints shall be raked clean of all mortar and other debris and shall be caulked and sealed as specified in Section 07 90 00.

G. Through-Wall Flashing:

1. See Section 07 65 10 for material to be used and installation requirements. In addition, follow the following general requirements:

a. Provide concealed flashing in cavity walls and other masonry work at or above all shelf angles, lintels, ledges and any other obstructions to the downward flow of water in the wall. Install such that any water collected shall be diverted to the exterior of the wall through weeps. Within masonry work, place flashing on a bed of mortar and cover with mortar. On metal lintels and plates, place flashing on a bed of compatible mastic or caulk below flashing to seal beneath flashing. Seal any tears or penetrations with compatible mastic before covering with mortar. Extend flashing the full length of lintels and shelf angles and a minimum of 4" into adjacent walls. Extend flashing from the face of the exterior wythe, through the wythe and up a minimum of 4" into the inner wythe to within 1/2" of its interior face. Turn up ends of flashing at least 2" to form a dam to prevent water flow over ends.

H. Tops of Walls:

1. Unless otherwise detailed on the Drawings, where CMU walls are extended to the underside of the building structure above, the wall shall be held down approximately 1" from the structure to allow for deflection of the structure. The space shall be filled with batt insulation specified in Section 07 21 10 for non-fire-rated walls and fire stopping specified in Section 07 84 00 for fire-rated walls and sealed as specified or shown for the particular wall type.

3.2 CONSTRUCTION TOLERANCES:

A. Variation from Plumb: For vertical lines and surfaces of columns, walls and arrises do not exceed 1/4" in 10', or 3/8" in a story height not to exceed 20', nor 1/2" in 40' or more. For external corners, expansion joints, control joints and other conspicuous lines, do not exceed 1/4" in any story or 20' maximum, nor 1/2" in 40' or more. For vertical alignment of head joints do not exceed plus or minus 1/4" in 10', 1/2" maximum.

B. Variation from Level: For bed joints and lines of exposed lintels, sills, parapets, horizontal grooves and other conspicuous lines, do not exceed 1/4" in any bay of 20' maximum, nor 1/2" in 40' or more. For top surface of bearing walls do not exceed 1/8" between adjacent floor elements in 10' or 1/16" within width of a single unit.

C. Variation of Linear Building Line: For position shown in plan and related portion of columns, walls and partitions, do not exceed 1/2" in any bay of 20' maximum, nor 3/4" in 40' or more.

D. Variation in Cross-Sectional Dimensions: For columns and thickness of walls, from dimensions shown, do not exceed minus 1/4" nor plus 1/2".

E. Variation in Mortar Joint Thickness: Do not exceed bed joint thickness indicated by more than plus or minus 1/8", with a maximum thickness limited to 1/2". Do not exceed head joint thickness indicated by more than plus or minus 1/8".

F. Face Tolerance for Brick Veneer: The face of any brick shall not vary more than 1/16" from being perfectly flush with the face of all adjacent bricks.

3.3 BUILT-IN WORK:

A. Consult other trades in advance and make provisions for installation of their work in order to avoid cutting and patching. Build in work specified under other Sections of the Specifications as the work progresses.

B. Set lintels in beds of mortar.

3.4 POINTING OF MASONRY:

A. At the completion of the masonry work, all holes in the exposed masonry shall be pointed. Defective joints shall be cut out and tuckpointed solidly with mortar. Pointing and tuckpointing shall be done with a pre-hydrated mortar. The mortar cement shall be controlled so that after curing of the mortar, no unacceptable difference in texture or color exists with that of adjacent masonry.

3.5 MASONRY PROTECTION:

A. Exterior masonry walls shall be protected from splattering and staining by mud and earth below the wall by covering the wall up to a height of approximately 30" with 4 mil polyethylene.

B. The poly shall extend out on the ground a minimum of 12" and be secured by placing adequate weight on the poly to prevent wind or other means from displacing the plastic. The top edge shall be secured in place by tucking into a horizontal mortar joint about 1/2" before the joint is filled with mortar.

C. After landscaping and grassing is in place and established, and when approved by the Architect, the poly shall be removed by cutting it away flush with the mortar joint with a sharp knife such that the remaining poly is not noticeable in the finished work.

3.6 MASONRY CLEANING:

A. While laying the masonry, good workmanship and job housekeeping practices shall be used so as to minimize the need for cleaning the masonry. Protect the base of the wall from mud splashes and mortar droppings, protect the wall by setting scaffolds so that mortar is not deflected onto the wall, and at the end of each work day, set the scaffolding boards so that they do not deflect rainfall onto newly laid masonry. Use toe boards or plastic drapes as required.

B. The laying technique shall be such that mortar does not run down the face of the wall or smear the mortar onto the masonry face. For split-face masonry, let mortar take some set to reduce water before cutting with trowel.

C. After the joints are tooled, cut off mortar tailings with the trowel and brush excess mortar burrs and dust from the face of masonry. Do not bag or sack the wall but use a masonry brush made with medium soft hair.

D. Remove all large mortar particles with a hardwood scraper.

E. If after using the above outlined techniques, additional cleaning of the walls is found necessary, allow the walls to cure one month prior to initiating further cleaning processes.

F. Saturate the wall with clean water. The wall shall be thoroughly saturated prior to and at the time the cleaning solution is applied.

G. Clean the wall only with an approved cleaning solution applied with a brush, starting at the top of the wall. Approved cleaning solutions are as follows: Sure-Klean 600, Vanatrol, Superior 800, or approved equal. Approved cleaners shall be composed primarily of detergents, wetting agents, buffering agents, and a maximum of 10% muriatic acid. The use of any of the above cleaning agents shall first be approved in writing by the manufacturer of the masonry being cleaned, and the Designer. The concentration, method of application of the cleaning solution, and method of scraping shall be as outlined on the container by the manufacturer.

H. Immediately after cleaning a small area, the wall shall be rinsed thoroughly with large quantities of water.

I. Protect adjacent surfaces and materials during cleaning operations.

J. After the walls are cleaned, take necessary precautions to ensure that other contractors and subcontractors do not damage or soil the walls. Mud protection around the base of walls shall be left in place until the final grading work is done.

K. Do not use acid, steel wool or other abrasives to clean masonry. Use masonry detergent cleaner such as Vana-Trol or Deox.

3.7 HIGH PRESSURE WATER AND SANDBLASTING:

A. High pressure water and sandblasting shall not be used for cleaning except with the written recommendation of the masonry manufacturer, and the written approval of the Architect. See Paragraph "Submittals" included in Part 1 of this Section for the required masonry cleaning submittal if high pressure water or sandblasting is proposed to be used. Do not use high pressure water or sandblasting to clean masonry prior to approval of this submittal by the Architect.

B. If high pressure water or sandblasting is proposed to be used to clean masonry, the submittal referenced above must be submitted by the Contractor and approved by the Architect and then a sample cleaning area for each method of cleaning proposed and for each type of masonry to be cleaned shall be cleaned by the Contractor and approved by the Architect before beginning cleaning of masonry. The approved sample areas shall become standards for the cleaned masonry walls to match.

END OF SECTION

SECTION 05 50 00
MISCELLANEOUS METAL FABRICATIONS

PART 1: GENERAL

1.1 RELATED DOCUMENTS:

A. Drawings and general provisions of Contract, including General and Supplementary General Conditions and Division 1 Specification Sections, apply to work of this Section.

1.2 SCOPE:

A. Work Included This Section:

1. Work to be provided herein includes all metal fabrications expressly specified hereinafter. In addition, all miscellaneous framing, bracing, supports, and other items required for the proper conduct of the work are included under this Section even if not specifically shown on the Drawings or specified herein.

1.3 INDUSTRY STANDARDS:

A. Some products and execution are specified in this Section by reference to published specifications or standards of the following (with respective abbreviations used). Reference is to the latest edition of the standard reference.

- The American Society for Testing and Materials (ASTM)
- Aluminum Association (AA)
- Corps of Engineers (CE)
- Federal Specifications (FS)
- American Iron and Steel Institute (AISI)
- American Welding Society (AWS)

1.4 SUBMITTALS:

A. Shop Drawings: Submit shop drawings for all shop fabricated work of this Section. Show layout, location, arrangement, details, sizes, materials, connections, finishes, and relation to adjacent work.

1. Provide templates for anchors and bolts specified for installation under other Sections.

B. Welding Certificates: Copies of certificates for welding procedures and personnel.

1.5 QUALITY ASSURANCE

A. Fabricator Qualifications: A firm experienced in producing metal fabrications similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.

Welding: Qualify procedures and personnel according to the following:

- AWS D1.1, "Structural Welding Code--Steel."
- AWS D1.2, "Structural Welding Code--Aluminum."
- AWS D1.3, "Structural Welding Code--Sheet Steel."

Certify that each welder has satisfactorily passed AWS qualification tests for welding processes involved and, if pertinent, has undergone recertification.

1.6 PROJECT CONDITIONS

A. Field Measurements: Where metal fabrications are indicated to fit walls and other construction, verify dimensions by field measurements before fabrication and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

1.7 COORDINATION

A. Coordinate the installation of anchorages for metal fabrications. 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 the Project site in time for installation.

PART 2: PRODUCTS

2.1 MATERIALS: Except as required specifically otherwise elsewhere in the Contract Documents, the following material requirements shall apply to this Section:

A. Ferrous Metals:

1. Metal Surfaces, General: For fabrication of miscellaneous metalwork which will be exposed to view, use only materials which are smooth and free of surface blemishes including pitting, seam marks, roller marks, rolled trade names and roughness.

2. Steel Plates, Shapes, and Bars: ASTM A 36.

3. Steel Bar Grating: ASTM A 569 or ASTM A 36.

4. Steel Tubing: Cold-formed, ASTM A 500; or hot-formed, ASTM A 501.

5. Steel Sheet: Hot-rolled, ASTM A 570; or cold-rolled, ASTM A 611, Class 1; of grade required for design loading.

6. Galvanized Steel Sheet: ASTM A 653, of grade required for design loading. Coating designation as indicated, or if not indicated, G90.

7. Steel Pipe: ASTM A 53; type and grade (if applicable) as selected by the fabricator and as required for design loading; black finish unless galvanizing is indicated; standard weight (Schedule 40), unless otherwise indicated.

8. Gray Iron Castings: ASTM A 48, Class 30.

9. Malleable Iron Castings: ASTM A 47, grade as selected by the fabricator.

10. Brackets, Flanges, and Anchors: Cast or formed metal of the same type material and finish as supported rails, unless otherwise indicated.

11. Concrete Inserts: Threaded or wedge type; galvanized ferrous castings, either malleable iron, ASTM A 47, or cast steel, ASTM A 27. Provide bolts, washers, and shims as required, hot-dip galvanized, ASTM A 153.

B. Aluminum Metals:

1. For extruded aluminum, AA Alloy No. 6063-T5.

2. Fasteners for Aluminum: Use fasteners made of the same basic metal as fastened metal except use galvanized fasteners complying with ASTM A 153 for exterior aluminum units unless otherwise indicated. Do not use metals that are corrosive or incompatible with metals joined.

C. Stainless Steel:

1. Provide austenitic stainless steel in the form indicated complying with the following requirements:

a. Tubing: ASTM A 554, Grades MT 301, MT 302, or MT 304, as standard with the manufacturer.

b. Pipe: ASTM A 312, Grade TP 304.

c. Castings: ASTM A 743, Grade CF 8 or CF 20.

d. Plate: ASTM A 167, Type 301, 302, or 304.

2. Finish for all stainless steel exposed to view is to be AISI #8 polished finish.

D. Grout:

1. Non-Shrink Non-Metallic Grout: Pre-mixed, factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with CE CRD-C621. Provide grout specifically recommended by the manufacturer for interior and exterior applications of type specified in this Section.

E. Fasteners:

1. General: Provide zinc-coated fasteners for exterior use or where built into exterior walls. Select fasteners for the type, grade, and class required.

2. Bolts and Nuts: Regular hexagon head type, ASTM A 307, Grade A.

3. Lag Bolts: Squarehead type, ASME B18.2.1 (ASME B18.2.3.8M).

4. Machine Screws: Cadmium plated steel, ASME B186.6 (ASME B18.6.7M).

5. Wood Screws: Flathead carbon steel, ASME B18.6.1.

6. Plain Washers: Round, carbon steel, ASME B18.22.1 (ASME B18.21.2M).

7. Masonry and Concrete Anchorage Devices: Wedge type expansion anchor such as Hilti-Kwik II, Phillips Wedge, Wej-It, or equal approved in writing by the Architect.

8. Toggle Bolts: Tumble-wing type, class, and style as required.

9. Lock Washers: Helical spring-type carbon steel, ASME B18.21.1 (ASME B18.21.2M).

F. Shop Paint:

1. Non-Galvanized Surfaces: PPG Speedhide Inhibitive Red Primer 6-208, or approved equal.

2. Galvanized Surfaces: PPG Speedhide Galvanized Steel Primer 6-209, or approved equal.

2.2 FABRICATION:

A. Work shall be well-formed to shape and size, with sharp lines and angles. Shearing and punching shall leave clean, true lines and surfaces. Weld or rivet permanent connections. Do not use screws or bolts where they can be avoided; but where used, heads shall be countersunk, screwed uptight and threads nicked to prevent loosening. Curved work shall be evenly sprung.

B. Castings shall be sound and free from warp, holes and other defects that impair their strength or appearance. Exposed surfaces shall have a smooth finish and sharp, well-defined lines and arrises. Machined joints, where required, shall be milled to a close fit. Provide necessary rabbets, lugs, and brackets so that work can be assembled in a neat, substantial manner.

C. Fastenings shall be concealed where possible. The thickness of metal, and details of assembly and supports, shall have ample strength and thickness. Joints exposed to weather shall be formed to exclude water. Provide holes and connections for the work of other trades.

D. At the proper time, deliver and set in place items of metal work to be built into adjoining construction.

2.3 WELDING:

A. All welding shall be done by experienced welders certified by an accredited testing laboratory for the welding involved in accordance with the rules of the American Welding Society.

B. All welds shall be power tool cleaned and the weld and surrounding area where the paint or galvanized coating has been burned away shall be painted with the type of paint specified hereinbefore for the galvanized or non-galvanized surface as applicable.

2.4 PAINTING AND GALVANIZING:

A. Clean metal (to receive paint) with cleaner specified under Section 09910 for use with specific metal.

B. Except as required specifically otherwise in the Contract Documents, apply primer on ferrous metalwork as specified herein.

C. Where hot-dipped galvanized or zinc-coated metal is required, it shall not be shop primed unless specifically called for, but all damaged places and weldings shall be touched up with zinc-rich primer where shop priming is not called for. Where hot-dipped galvanizing or hot-zinc coating is specified, it shall be done in accordance with the Standard Specifications of the American Hot Dip Galvanizers Association.

D. Galvanizing:

1. Hot-dip galvanizing or zinc coatings applied on fabricated steel products shall comply with ASTM A 123.

2. Galvanized surfaces for which a shop coat of paint is specified shall be chemically treated to provide a bond for the paint.

3. Vent and drain holes in items to be hot-dip galvanized shall be drilled and not burned so that holes are precise and neat. Holes that are visible and detract from the attractiveness of the installed item shall be plugged as directed by the Architect.

2.5 MISCELLANEOUS REINFORCING AND BRACING:

A. Provide miscellaneous metal shapes as detailed on Drawings for bracing and support of related work were not required specifically elsewhere in the Contract Documents.

B. Shop paint ferrous metal.

2.6 MISCELLANEOUS LINTELS:

A. Provide angle lintels where required in masonry openings not provided for on the Drawings.

B. In nonload bearing walls, provide one 3 1/2" x 4" x 5/16" for each 4" thickness of masonry for openings up to 6'-0" wide. Pairs of lintels shall be bolted or welded together. Field paint as required.

C. Lintels are to be galvanized in accordance with ASTM A 123.

PART 3: EXECUTION

3.1 PREPARATION:

A. Coordinate and furnish anchorages, setting drawings, diagrams, templates, instructions, and directions for installation of anchorages, including concrete inserts, sleeves, anchor bolts, and miscellaneous items having integral anchors that are to be embedded in concrete or masonry construction. Coordinate the delivery of such items to project site.

B. Center nosings on tread widths with noses flush with riser faces and tread surfaces.

C. Set sleeves in concrete with tops flush with finish surface elevations; protect sleeves from water and concrete entry.

3.2 INSTALLATION - GENERAL:

A. Fastening to In-Place Construction: Provide anchorage devices and fasteners were necessary for securing miscellaneous metal fabrications to in-place construction; include threaded fasteners for concrete and masonry inserts, toggle bolts, through-bolts, lag bolts, wood screws, and other connectors as required.

B. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installation of miscellaneous metal fabrications. Set metal fabrication accurately in location, alignment, and elevation; with edges and surfaces level, plumb, true, and free of rack; and measured from established lines and levels.

C. Provide temporary bracing or anchors in formwork for items that are to be built into concrete masonry or similar construction.

D. Fit exposed connections accurately together to form hairline joints. Weld connections that are not to be left as exposed joints, but cannot be shop welded because of shipping size limitations. Do not weld, cut, or abrade the surfaces of exterior units which have been hot-dip galvanized after fabrication, and are intended for bolted or screwed field connections.

E. Field Welding: Comply with AWS Code for procedures of manual shielded metal-arc welding, appearance, and quality of welds made, methods used in correcting welding work, and the following:

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 welding flux immediately.

4. At exposed connections, finish exposed welds and surfaces smooth and blended so that no roughness shows after finishing and contour of welded surface matches those adjacent.

F. Corrosion Protection: Coat concealed surfaces of aluminum that will meet grout, concrete, masonry, wood or dissimilar metals with a heavy coat of bituminous paint or zinc chromate primer.

3.3 SETTING LOOSE PLATES:

A. Clean concrete and masonry bearing surfaces of any bond-reducing materials, and roughen to improve bond to surfaces. The clean bottom surface of bearing plates.

B. Set loose leveling and bearing plates on wedges, or other adjustable devices. After the bearing members have been positioned and plumbed, tighten the anchor bolts. Do not remove wedges or shims, but if protruding, cut off flush with the edge of the bearing plate before packing with grout.

1. Use metallic nonshrink grout in concealed locations where not exposed to moisture; use nonmetallic nonshrink grout in exposed locations, unless otherwise indicated.

2. Pack grout solidly between bearing surfaces and plates to ensure that no voids remain.

3.4 ADJUSTING AND CLEANING:

A. Touch-Up Painting: Cleaning and touch-up painting of field welds, bolted connections, and abraded areas of the shop painted on miscellaneous metal are specified in Division 9 Section PAINTING of these Specifications.

B. For galvanized surfaces, clean welds bolted connections and abraded areas and apply galvanizing repair paint to comply with ASTM A 780.

END OF SECTION

SECTION 06 10 00
ROUGH CARPENTRY

PART 1: GENERAL

1.1 RELATED DOCUMENTS:

A. Drawings and general provisions of Contract, including General and Supplementary General Conditions and Division 1 Specification Sections, apply to work of this Section.

1.2 SCOPE:

A. Related Work Specified Elsewhere:

1. TPO roofing (Section 07 53 00).

B. Work Included This Section:

1. Rough carpentry work as shown on Drawings and as specified herein. Include wood nailers, blocking, furring, grounds, sheathing, rough hardware, framing, shoring, bracing, scaffolding, and barriers required for installation of the work shown on the Drawings. Include preservative-treated wood curbs and nailers for roofing work specified in Section 07 53 00.

2. Rough carpentry work generally includes carpentry work provided on the job that is concealed from view in the completed work.

1.3 SUBMITTALS:

A. Certificates:

1. Submit certificates from applicator of preservative treatment, stating the type of treatment, manufacturer of treating chemical material, degree of treatment of wood members processed for this Project. A certificate shall be signed by an officer of the company.

2. Submit certificates certifying that flame spread, fuel contributed and smoke developed rating of the fire retardant treated wood meets or is below limits required by applicable codes and requirements of this Section. Include manufacturer's literature describing the type of treatment, manufacturer, and description of treating chemical material and degree of treatment of wood members processed for this Project.

1.4 PRODUCT HANDLING:

A. Materials that are delivered to the Project Site in a wet condition shall be rejected, removed from the Project Site, and replaced with new and dry materials without additional cost to the Owner. Stack materials in dry storage that furnish proper ventilation, drainage, and protection from the elements. Stack in such a way that it will prevent warpage.

B. See moisture content requirements hereinafter.

1.5 INDUSTRY STANDARDS:

A. Some products and execution are specified in this Section by reference to published specifications or standards of the following (with respective abbreviations used). Reference is to the latest edition of the standard reference.

- American Lumber Standards Committee (ALSC)
- American Plywood Association (APA)
- American Wood Preservative Association (AWPA)
- Underwriter's Laboratories Inc. (UL)
- U. S. Department of Commerce
- Product Standards (PS)

PART 2: PRODUCTS

2.1 MATERIALS:

A. Moisture Content: Solid wood and plywood preservative-treated and fire retardant treated shall be dried to a maximum moisture content of 19%. Untreated solid wood and plywood shall also be dried to a maximum moisture content of 19%.

B. Grade and Trademark: Grade and trademark shall be on each piece of lumber (or bundle in bundled stock). Use only the recognized official marks of the Association under whose rules it is graded.

C. Quality: Lumber shall be sound, thoroughly seasoned, well manufactured, and free from warp that cannot be corrected in process of bridging or nailing.

D. Grades and Species of Solid Wood: Grades and species of lumber shall be as follows:

1. Grounds, Blocking, Nailers, Furring, and Miscellaneous Uses: No. 2 Southern Yellow Pine.

E. Plywood:

1. Fir or pine plywood conforming to PS 1 of the U. S. Dept. of Commerce, and mfd. by a member of the American Plywood Assn. Provide interior plywood with exterior glue, (except for roofing or exterior wall work and elsewhere as noted on the Drawings, provide exterior grade plywood with exterior glue) of thicknesses shown on the Drawings and grades as follows:

a. Provide C-D face veneers where concealed from view. If exposed to view in the finished work, provide A Grade on the exposed face.

F. Rough Hardware:

1. Except as specifically required otherwise in the Contract Documents, furnish and install all rough carpentry hardware and metal fasteners as shown on the Drawings specified herein or required for proper installation of carpentry. Nails, spikes, screws, bolts, and similar items shall be of sizes and types to rigidly secure members in place.

G. Preservative Treatment:

1. Where lumber or plywood is required to be preservative treated, comply with applicable requirements of AWPA C2 (lumber) and AWPA C9 (plywood). Mark each treated item with the Quality Mark Requirements of an inspection agency approved by ALSC's Board of Review.

2. For exposed items indicated to receive stain finish, use chemical formulations that do not bleed through, contain colorants, or otherwise adversely affect finishes.

3. Pressure treat aboveground items with waterborne preservatives to minimum retention of .25 lb/cu ft. (4.0 kg/cu. m)

4. Pressure-treated wood members in contact with ground or freshwater with waterborne preservatives to minimum retention of .40 lb/ cu. ft. (6.4 kg/ cu. m.)

5. Treated material showing delamination, cracking or other structural defects shall be rejected.

H. Fire Retardant Treatment:

1. Where fire-retardant-treated wood is required, comply with applicable requirements of AWPA C20 (lumber), and AWPA C27 (plywood). Identify fire-retardant-treated wood with appropriate classifications marking of UL; US Testing Timber Products Inspection, Inc; or another testing and inspecting agency acceptable to authorities having jurisdiction. The label or stamp shall be such as to further designate that there is no change in the listed classification when the material has been subjected to the standard Underwriter's Laboratories rain test.

2. Treatment shall not in any way adversely affect roofing materials nor products containing gypsum, pitch, petroleum, and petroleum by-products.

I. Ply Clips:

1. H-shaped aluminum clips, minimum 1/16" thickness, for securing and spacing adjacent edges of plywood roof sheathing. Use clips at all edges of plywood panels, including edges nailed to the top chord of roof truss and unsupported edges.

PART 3: EXECUTION

3.1 INSTALLATION:

A. Wood Grounds, Blocking, Nailers, Curbs, Furring and Other Miscellaneous Uses:

1. Provide wood grounds, blocking, nailers, curbs, furring, etc. of size and shape required for bringing materials to a true surface, for securing wood trim and were required to secure other work or equipment in place. All work shall be accurately set in place, plumb, true, even, in perfect alignment, and securely fastened. Accurately and carefully fit, cut, finish flush, straight and true. Wood blocking or nailers on steel framing shall be bolted thereto.

2. Install wood furring as shown on Drawings. Secure to substrate with appropriate fasteners to provide rigid, permanent connections. Shim furring out as necessary to bring furring to true planes.

3. Install nailers at roof perimeters and at all penetrations of roofing for securing work and flashing in place. Secure nailers to roofing deck and make flush with insulation or as shown otherwise on the Drawings. Anchor wood nailers to resist a force of 75 lbs/LF in any direction. The thickness of the nailer shall be such that the top of the nailer is flush with the surface to which the roofing membrane is to be applied as shown on the membrane manufacturer's approved details and approved shop drawings.

C. Locations of Treated Wood:

1. Use preservative-treated wood where noted on the Drawings, where wood is in contact with masonry or concrete, for blocking and nailers used in roof construction and wherever used in exterior walls. If the wood is in a location requiring fire retardant treatment, then the wood shall be fire retardant treated rather than preservative treated.

2. Use fire retardant treated wood at the following locations:

   a. Where located in fire-rated walls, ceilings, floors, or other fire-rated construction.

   b. Where shown on the Drawings.

   c. Where required by the North Carolina State Building Code or other prevailing codes.

END OF SECTION

SECTION 07 14 00
FLUID APPLIED WATERPROOFING MEMBRANE

PART 1: GENERAL

1.1 RELATED DOCUMENTS:

A. Drawings and general provisions of Contract, including General and Supplementary General Conditions and Division 1 Specification Sections, apply to work of this Section.

1.2 SCOPE:

A. Work Included This Section:

1. Fluid applied waterproofing membrane and stainless-steel drip plate for use at locations shown on the Drawings. Include all accessory materials required for a complete and proper installation.

1.3 INDUSTRY STANDARDS:

A. Some products and execution are specified in this Section by reference to published specifications or standards of the following (with respective abbreviations used). Reference is to the latest edition of the standard reference.

- The American Society for Testing and Materials (ASTM)

1.4 QUALIFICATIONS:

A. Source: Products for use of this Project shall be of one manufacturer unless noted specifically otherwise herein.

B. Applicators: Submit a letter from the manufacturer of waterproofing materials stating that the applicator is approved by the manufacturer for application of the waterproofing system specified for the Project. The letter shall certify that the applicator has satisfactorily applied the type of system specified on projects which have been completed for at least three years. The letter shall be on the manufacturer's letterhead and shall be signed by an officer of the company.

1.5 SUBMITTALS:

A. Manufacturer's Data:

1. Manufacturer's technical data and installation procedures for all materials.

2. Test results or printed product data showing that the manufacturer's material fulfills the requirements of these Specifications.

B. Mock-Ups:

1. Apply fulid applied air barrier system to field-constructed mock-up assemblies, illustrating material interfaces and seals. Use the manufacturer’s application instructions. Keep mock-ups available for inspection throughout the project.

1.6 PRODUCT HANDLING:

A. Delivery of Materials: Materials shall be delivered to the Project Site in the manufacturer's original, unopened containers with the manufacturer's brand name marked thereon.

1.7 ENVIRONMENTAL CONDITIONS:

A. Weather: No waterproofing shall be applied in wet weather nor when the threat of rain exists within 12 hours.

B. Temperature: Do not apply when surface or air temperatures are below 25 degrees Fahrenheit or above 100 degrees Fahrenheit.

PART 2: PRODUCTS

2.1 MATERIALS:

A. Provide Prosoco R-Guard Spray Wrap MVP, or equal by other manufacturers, consisting of the following materials and all other accessory materials recommended by the manufacturer of the waterproofing system for the indicated application and the specified warranty.

1. Specific Gravity: 1.40
2. pH: 8.5-9.5
3. WT/GAL: 11.69 lbs
4. Total Solids: 63-68%
5. VOC Content <18 g/L
6. Freeze Point: 32 degrees F
7. Minimum Performance Requirements: The minimum performance requirements for the waterproofing system to be as follows:

Performance Requirements of Cured Film

Phyical Properties	Results	ASTM Test Method
Water Vapor Transmission	25 perms at 10 mils	E96 Wet Cup
Air Permeance	0.0024 L/sm2 at 75 Pa	E2178
Air Leakage of Air Barrier Assembly	0.0028 L/sm2 at 75 Pa	E2357

B. Provide Hohmann & Barnard stainless-steel Drip Plate, or equal.

PART 3: EXECUTION

3.1 INSPECTION:

A. Substrate: Verify that the substrate to receive waterproofing meets the following requirements:

1. That the substrate surface is free of ridges and sharp projections.

2. That the CMU does not contain voids or gaps, or "honeycomb" surfaces.

3. That surfaces to receive fluid-applied waterproofing are free of dirt and debris.

3.2 MANUFACTURER'S RECOMMENDATIONS:

A. The waterproofing system shall be installed following the manufacturer's written recommendations and per the general instructions specified herein.

3.3 PREPARATION:

A. See “Preparation” section in the Manufacturer’s Product Data Sheet.

B. Do not dilute or alter product. Mix well before use with a low-speed drill and clean mixing paddle. Avoid mixing air into the membrane. Do not add water, over mix, or add accelerators or retarders.

3.4 APPLICATION:

A. Exterior Sheathing:

1. Apply sufficient product to achieve a continuous, pinhole free coating. Some gypsum sheathing will require additional material due to varying substrate porosity.
2. When spray applying, back rolling is necessary to ensure ther are no pinholes, voids, or gaps in the membrane.
3. Inspect membrane before covering. Repair any deep gouges, punctures, or damaged areas. If the surface of the primary air barrier or liquid flashing membrane is damaged during construction, remove all loose surface contaminants before selective recoating with additional product. Overlap repairs, penetrating treatments, transitions, rigid flashing, and other air barrier components to ensure positive drainage and continuity of the air and water-resistive barrier.

B. CMU Wall Construction:

1. Apply sufficient product to fill and cover the entire face of the exterior wall assembly. Let dry.
2. Apply a second coat to achieve hide. The finished application must be continuous and free of voids and pinholes. Back rolling spray applications is necessary to maximize coverage for a void and pinhole free surface. Take special care to achieve full coverage around wall ties or surface irregularities.
3. Inspec membrane before covering. Repair any deep gouges, punctures or damaged area with additional product. If the surface of the primary air barrier or liquid flashing memberane is damaged during construction, remove all loose surface contaminants before slelctive recoating with additional product. Overlap repairs, penetration treatments, transitions, rigid flashing, and other air barrier components to ensure positive drainage and continuity of the air and water-resistive barrier.

3.5 CURING AND DRYING:

A. Curing and drying times vary with temperature, humidity, and surface conditions. Protect from rain until completely cured. Surface temperatures should remain at least 25 degrees Fahrenheit and rising after application and until curing is complete. Product dries to the touch in one hour and can be re-coated in two hours. Product drying time is twelve hours at 70 degrees Fahrenheit and 50 percent realative humidity.

3.6 CLEAN-UP:

A. Clean tools and equipment with soapy water immediately after use. Dried material must be removed mechanically.

END OF SECTION

SECTION 07 20 00
RIGID INSULATION

PART 1: GENERAL

1.1 RELATED DOCUMENTS:

a. Drawings and general provisions of Contract, including General and Supplementary General Conditions and Division 1 Specification Sections, apply to work of this Section.

1.2 SCOPE:

a. Related Work Specified Elsewhere:

1. Unit masonry (Section 04 20 00 & 04 20 10).
2. Flexible insulation (Section 07 21 16).

b. Work Included This Section:

1. Expanded polystyrene insulation board.
2. Adhesive, tape, mastic, fasteners and all other supplementary materials required for a complete and proper installation.

1.3 INDUSTRY STANDARDS:

a. Some products and execution are specified in this Section by reference to published specifications or standards of the following (with respective abbreviations used). Reference is to the latest edition of the standard referenced.

American Society for Testing Materials (ASTM)

1.4 SUBMITTALS:

a. Manufacturer's Data: Submit (in duplicate) manufacturer's printed information giving physical data, technical data, installation instructions and other data on insulation and adhesive or other required fasteners.

1.5 PRODUCT HANDLING:

a. Delivery of Materials: Materials shall be delivered to the Project Site in manufacturer's original, unopened packages with manufacturer's brand name clearly marked thereon.

b. Handle and store in accordance with the insulation manufacturer's written instructions.

PART 2: PRODUCTS

2.1 MATERIALS:

a. Rigid Insulation:

1. Material: Closed cell light weight expanded polystyrene insulation by Carlisle, Insulfoam IX, or approved equal, extruded polystyrene insulation board conforming to ASTM C 578, Type IX, with the following physical properties:

(a) Density – 2.0 lbs. per cu. ft. minimum.

(b) Compressive Strength - 25 psi minimum.

(c) Water Vapor Permeability – 2.0 perm maximum, 1 inch.

(d) "R" Factor - Thermal Resistance (5-year aged value).
Mean temperature 25° F. – 5 minimum.

2. Insulation shall be thickness shown on the Drawings and if not shown on the Drawings shall be 2” thick.

b. Adhesive: For use where required to secure the insulation permanently to its substrate, shall be acceptable to the insulation board manufacturer.

c. Impaling Clips: Shall be annealed nail spindle mechanically attached (welded) to 2 3/4" x 2 3/4", 24-gauge thick galvanized steel perforated base with nylon washer.

d. Impaling Clip Adhesive: Shall be as manufactured by clip manufacturer and recommended for installation on surfaces to which clips are to be attached.

e. Installation Accessories: Shall be either furnished by or a type recommended by the insulation manufacturer.

PART 3: EXECUTION

3.1 COORDINATION WITH WORK OF OTHER TRADES:

a. Coordinate installation of rigid insulation with related work specified in other Sections of these Specifications.

b. Work of other trades to be concealed by or passed through insulation shall be completed and tested before work under this Section is started in any area.

3.2 INSPECTION AND PREPARATION:

a. Require installer to examine substrates and conditions under which insulation work is to be performed. Do not proceed with installation of insulation until unsatisfactory conditions have been corrected.

b. Clean substrates of substances harmful to insulation including removal of projections which might prevent proper placement of insulation.

3.3 INSTALLATION, GENERAL:

a. Comply with manufacturer's instructions for particular conditions of installation in each case. If printed instructions are not available or do not apply to project conditions, consult manufacturer's technical representative for specific recommendations before proceeding with work.

b. Extend insulation full thickness as shown over entire area to be insulated. Cut and fit tightly around obstructions, and fill voids with insulation. Remove projections which interfere with placement.

c. Apply a single layer of insulation of required thickness, unless otherwise shown or required to make up total thickness.

3.4 FOUNDATION AND PERIMETER INSULATION:

a. On vertical surfaces, set units in adhesive applied in accordance with manufacturer's instructions. Use type of adhesive specified and as recommended by manufacturer of insulation.

b. Protect insulation on vertical surfaces (from damage during backfilling) by application of protection board. Set in adhesive in accordance with recommendations of manufacturer of insulation.

3.5 INSTALLATION OF GENERAL BUILDING INSULATION:

a. Apply insulation units to substrate by method indicated, complying with manufacturer's recommendations. If no specific method is indicated, bond units to substrate with adhesive to provide permanent placement and support of units.

b. Seal joints between insulation units by applying mastic or sealant to edges of each unit to form a tight seal as units are shoved into place. Fill voids in completed installation with mastic or sealant.

3.6 CONDITION OF SURFACES:

a. All surfaces to receive rigid insulation shall be free of projections to provide maximum contact between the substrate and the insulation board. The entire surface within a cavity wall shall be free of projections to provide the maximum possible air space in the remaining cavity between insulation and outer wythe of the wall.

3.7 PROTECTION:

a. General: Protect installed insulation from harmful weather exposures and from possible physical abuses, where possible by non-delayed installation of concealing work or, where that is not possible, by temporary covering or enclosure. Damaged work shall be replaced at no additional cost to the Owner.

END OF SECTION

SECTION 07 21 16
FLEXIBLE INSULATION

PART 1: GENERAL

1.1 RELATED DOCUMENTS:

A. Drawings and general provisions of Contract, including General and Supplementary General Conditions and Division 1 Specification Sections, apply to work of this Section.

1.2 SCOPE:

A. Related Work Specified Elsewhere:

1. Roofing insulation (Section 07 53 00)
2. Rigid insulation (Section 07 20 00).
3. GWB work (Section 09 29 00).

B. Work Included This Section:

1. Thermal fiberglass batt insulation and mineral wool insulation.
2. All supplementary materials and accessories required for a complete and proper installation.

1.3 SUBMITTALS:

A. Manufacturer's Literature and Installation Instructions: Submit manufacturer's literature completely describing each type of insulation and including thermal resistances and acoustical ratings for the various thicknesses indicated to be installed in this Project. Also, submit the manufacturer's written installation instructions for each type of installation required on this Project.

PART 2: PRODUCTS

2.1 MATERIALS:

A. Flexible Batt Insulation:

1. Insulation shall be fiberglass type as manufactured by Owens Corning, Certainteed/St.Gobain, Johns Manville, or equal approved in writing by the Architect. Insulation shall have a vapor-barrier on one side of aluminum foil at all exterior walls and ceilings.

2. Foil-faced insulation shall comply with ASTM C 665, Type II, Class B.

3. Provide thickness as shown on Drawings. Insulation shall provide the following minimum thermal resistance ratings (R-values) for the various thicknesses listed.

- 3 1/2" thick R-11
- 3 5/8" thick R-13
- 6" thick R-19
- 9" thick R-30

4. Insulation to be installed in metal stud construction shall be "full width" (16" or 24"). Do not use residential width (15" or 23") in metal stud walls.

B. Mineral Wool: High-density, noncombustible fibers.

C. Installation Accessories: Impaling clips, adhesives, tape, and other required accessories shall either be furnished by or a type recommended in writing by the insulation manufacturer.

PART 3: EXECUTION

3.1 LOCATIONS: Install insulation at locations shown on Drawings.

3.2 INSTALLATION:

A. Install faced insulation with a vapor barrier facing toward the interior of the building.

B. Follow written recommendations of the manufacturer of insulation and of fasteners for a method of attaching insulation... In addition to the manufacturer's recommendations, comply with the following procedure to prevent insulation in walls from sagging and leaving an uninsulated space at top of the wall: Lap edges of insulation over metal studs. Tape the first lap to the metal stud and tape the second lap to the first lap.

C. Butt ends and edges of insulation batts together and tape for continuous sealed installation. Split and cut the insulation to fit around the pipe, boxes, etc. Where possible, make continuous behind such objects by overlapping insulation.

D. Provide impaling clips, wire lattice or UL approved plastic netting to support insulation in a vertical or horizontal position if necessary to prevent tearing or sagging. Also, comply with the requirement specified in Paragraph 3.2 b. above to prevent insulation in walls from sagging and leaving an uninsulated space at top of the wall.

END OF SECTION

SECTION 07 31 10
FIBERGLASS ROOFING SHINGLES

PART 1: GENERAL

1.1 SCOPE:

a. Related Work Specified Elsewhere:

1. Rough carpentry (Section 06 10 00).

2. Flashing and sheet metal (Section 07 62 00).

b. Work Included This Section:

1. Furnish and install fiberglass shingles and related roofing materials specified herein.

2. Installation of flashing and gutter work is specified under Section 07 62 00.

1.2 QUALIFICATIONS:

a. Manufacturers:

1. Standard: For purposes of designating type and quality for the work under this Section, Drawings and Specifications are based on products manufactured or furnished by CertainTeed Corporation. Manufacturers of similar and equal products will be acceptable for use on the Project when approved (in writing) by the Architect for the function, appearance, and compatibility with other work on the Project.

b. Roofing Subcontractor: Before starting any part of the work, present to the Architect a letter from the roofing manufacturer stating that the roofing subcontractor is an approved applicator. The letter shall be on the company letterhead and shall be signed by a local representative of the company.

1.3 SUBMITTALS:

a. Samples:

1. Submit two (2) of each style shingles selected indicating full range of color.

b. Manufacturer's Data: Submit (in duplicate) manufacturer's standard specifications and recommended installation procedures.

c. Certificate of Compliance: Furnish duplicate copies of the Certificate of Compliance from each manufacturer of materials for work of this section. Certificates shall state requirements of the Contract Documents. Itemize products and refer to product standards used in these specifications.

1.4 PRODUCT DELIVERY, STORAGE AND HANDLING:

a. Deliver materials with manufacturer's labels intact and legible.

b. Deliver materials in sealed packages with Underwriters Laboratories, Inc. labels.

c. Store materials on raised platforms and protect with coverings at outdoor locations.

d. Do not stack bundles of shingles more than 4 ft. high.

1.5 JOB CONDITIONS:

a. Do not install underlayment of shingles on wet surfaces.

b. Do not apply shingles when air temperature is below 40 degrees.

1.6 GUARANTEE-WARRANTY:

a. Contractor shall warrant roofing system to conform to requirements of the Contract Documents. He shall further guarantee to repair the roofing system in the event of leaks or other failure of any part of the roofing system and to repair or replace material and finishes on the interior of the building resulting from failure of the roofing system for a period of two (2) years from date of final acceptance.

b. Roofing manufacturer shall provide 30-year Prorated Limited Warranty for materials furnished on this project.

PART 2: PRODUCTS

2.1 MATERIALS:

a. Fiberglass Roofing Shingles: Provide CertainTeed Landmark Premium shingles, or approved equal. Shingles shall incorporate the following features.

1. Shingles shall carry UL Class A Label and Wind Resistant Label.

2. Shingles shall conform to ASTM D 3018, Type 1 and to ASTM D 3161.

3. Shingles shall consist of a fiberglass mat laminated between two layers of asphalt coating material and with ceramic coated mineral granual top coating with heat-activated adhesive strips to bond the shingles together.

4. Shingles shall have 5" exposure, 2" headlap and be sized to cover 100 sq. ft. per 80 shingle strips.

5. **Color: To match existing. Sample to be approved by Architect in writing.**

b. Roofing Felt: 15 lb. asphalt-impregnated glass-fiber felt, complying with ASTM D 2178, Type IV.

c. Ridge Vent: GAF Cobra Ridge Vent, or equal approved in writing by the Architect, 8” wide by 3/4” thick, 50’ length per roll. Ridge Vent is to be covered with ridge cap shingles in color and texture to match the roof shingles.

d. Hip and Ridge Shingles: Provide factory pre-cut hip and ridge shingles.

e. Fasteners: Fasteners shall be one of the following, as recommended by shingle manufacturer:

1. Nails: Hot galvanized or aluminum 11 or 12 ga. barbed shank, 3/8" head, sharp pointed conventional, of sufficient length to penetrate through plywood sheathing.

2. Staples: All staples are to be pneumatically-applied, zinc-coated, 16-gauge minimum with minimum crown width 15/16" and sufficient length to penetrate through plywood sheathing.

f. Roofing Cement: Federal Specification SS-C-153C, Type 1, Class A, as recommended by roofing manufacturer.

PART 3: EXECUTION

3.1 GENERAL:

a. All surfaces to which shingles are to be applied shall be uniform, smooth, sound, clean, dry, and free of irregularities. Do not start work until unsatisfactory conditions are corrected.

b. Installation of metal flashing and concealed gutter work shall have been completed prior to installation of shingles.

c. Verify that work of other trades that penetrate roof deck has been completed.

3.2 INSTALLATION:

a. Felt Underlayment:

1. Lay one layer of felt horizontally over entire roof, lapping each course 2" minimum at horizontal joints, and 4" side lap at end joints.

2. Lap felt 6" from both sides over hips and ridges.

3. Secure underlayment to deck with sufficient fasteners to hold in place until shingles are applied.

b. Flashing and Concealed Gutter Work: Install as detailed on Drawings and as shown on approved shop drawings.

c. Starter Strip/Chalk Lines:

1. Starter Strip: Shingles with tabs cut off shall be used as starter strips. Starter strip shingles shall overhang the concealed gutter work by 1/2". Fasten starter strip using same spacing as for shingles, and locate fasteners about 3" up from the bottom edge. Avoid fastening where cut-outs will occur on the first course of shingles.

2. Chalk Lines:

(a) Snap chalk lines to guide application and maintain level lines parallel with the eaves and ridge.

(b) At hip roofs strike vertical chalk line. Apply shingles left and right as described in manufacturer's application instructions.

3. Trimming Shingles: At hip roofs trim off even with hips.

d. Fasteners: Refer to manufacturer's application instructions for fastener spacing.

e. Shingles: Shingle pattern, alignment and anchoring pattern shall be in strict accordance with the shingle manufacturer's published recommendations.

f. Ridge Vent: Install in accordance with the vent and roofing shingle manufacturer’s published instructions and cover with ridge cap shingles in color and texture to match the roof shingles.

g. Hips and Ridges: Use manufacturer's factory pre-cut hip and ridge shingles. Start hip or ridge with a triple thickness of pre-cut hip and ridge shingles. Continue application with double thickness, fastening as recommended by manufacturer.

3.3 ADJUST AND CLEAN:

a. Replace all damaged shingles.

b. Upon completion of installation remove all debris from the job site.

3.4 EXTRA STOCKAGE:

a. Furnish to the Owner one square of roofing shingles in original packaging for future use.

END OF SECTION

SECTION 07 62 00
FLASHING AND SHEET METAL

PART 1: GENERAL

1.1 RELATED DOCUMENTS:

a. Drawings and general provisions of Contract, including General and Supplementary General Conditions and Division 1 Specification Sections, apply to work of this Section.

1.2 SCOPE:

a. Related Work Specified Elsewhere:

1. Membrane roofing and insulation (Section 07 53 00).

b. Work Included This Section:

1. Furnish and install general sheet metal flashing, coping cap, and other types of flashing as shown on Drawings, as specified herein and as required for watertight construction.

1.3 INDUSTRY STANDARDS:

a. Some products and execution are specified in this Section by reference to published specifications or standards of the following (with respective abbreviations used). Reference is to the latest edition of the standard referenced.

The American Society for Testing and Materials (ASTM)
Federal Specifications (FS)
Sheet Metal and Air Conditioning Contractors National Association (SMACNA)

1.4 SUBMITTALS:

a. Shop Drawings: Shall be submitted describing materials, details and installation of the roofing system. Shop drawings shall be reviewed and approved by the General Contractor and the manufacturer prior to submittal to the Designer.

PART 2: PRODUCTS

2.1 MATERIALS:

a. Sheet Metal for General Sheet Metal Work: Use the thicknesses or gauges listed below unless shown otherwise on the Drawings. Unless a particular type of metal is noted on the Drawings or specified, the Contractor will have the option to select from the types listed below.

1. Aluminum: ASTM B 209, alloy 3003, tempered, .032" thick unless specified or indicated to be thicker.

2. Stainless Steel: AISI Type 302/304, ASTM A 167, 2D annealed finish, soft except where harder temper required for forming or performance; 0.015" thick (28 gauge) except as otherwise indicated.

3. Treated Sheet Metal: Bonderized, galvanized sheet steel, minimum 22 gauge.

b. Solder: Containing at least 50% tin.

c. Nails: Flat head, zinc coated with galvanized sheet.

d. Flux for Soldering: As recommended by manufacturer of sheet metal.

e. Powder-Actuated Fasteners: Corrosion-resistant fasteners, sized as recommended by manufacturer for specific function and substrate.

f. Caulking Compound: Urethane or silicone sealant approved for use in Section 07900 for the particular application.

g. Mastic: Shall be waterproof, non-sagging type as recommended by the manufacturer for the use intended.

h. Rubber Sheet: Shall be 1/16" thick neoprene or butyl sheet.

2.2 PRE-FINISHED COPING CAP:

a. All materials shall aluminum alloy, commercial quality, primed and finished with fluoropolymer 2-coat thermocured system (Kynar type) composed of specially formulated inhibitive primer and fluoropolymer color topcoat containing not less than 70% polyvinylidene fluoride resin by weight, complying with AAMA 2605.

b. A wash coat of .3 to .4 mil dry film thickness shall be applied to the reverse side.

c. The pre-painted finished side shall be coated with a factory installed strippable film for protection of the finished surface during shipping, fabrication and installation.

d. The material shall be protected from heat and direct sunlight to prevent deterioration of the strippable film and possibly the finished coating.

e. Color will be selected by the Architect from manufacturer’s standard colors.

f. Materials shall be cut, formed or riveted using hand or power tools. Fabricate and install in accordance with the Drawings and Specifications using recognized sheet metal practices.

g. Keep cutting edges sharp, clean, properly dressed and closely aligned. Exercise care during fabrication and erection to avoid damage.

h. Use color matched touch-up paint and rivets where exposed to view.

i. Coating must be mechanically removed if soldering is necessary.

j. All fabrication and installation shall be accomplished with strippable film in place.

k. After fabrication is complete, immediately remove strippable film. Extended exposure of strippable film to ultraviolet light may damage the paint coating underneath.

l. Provide butt joints with splice plates behind of same material and finish.

m. Provide hemmed edges. Raw cut edges will not be acceptable.

n. Warranty:

1. Provide a 10-year non-prorated paint coating warranty covering fade, chalking and film integrity. The warranty shall include labor and materials through the 10th year.

2. The paint coating shall not show a color change greater than 5 NBS color units per ASTM D2244 and shall not show chalking in excess of 8 per ASTM D659.

PART 3: EXECUTION

3.1 GENERAL REQUIREMENTS FOR METAL FLASHING AND TRIM:

a. Sheet metal shall be watertight with provisions for expansion and contraction.

b. Paint all sheet metal surfaces which will be in contact with roofing, concrete or mortar with bituminous paint. Similarly paint dissimilar metal in contact with one another to prevent galvanic action.

c. Sheet metal work shall conform to requirements of Sheet Metal and Air Conditioning Contractors National Association Inc. (SMACNA) Architectural Sheet Metal Manual, Washington, DC, latest edition. Copper flashing shall conform to the design principle and techniques of sheet copper construction set forth in the latest edition of "Copper and Common Sense" by Revere Copper and Brass Inc.

d. Corners of copings gravel stop/ fascia shall be factory mitered and welded prior to finishing. Form and fabricate in shop.

e. Fabricate flashing and trim to the profile shown in 8'-0" lengths or longer except where shorter lengths are required by construction or sheet size. All exposed edges shall be turned under for stiffness; no exposed sheared or raw edges shall be permitted.

f. Seams shall be neatly finished with true sharp lines free of oil can buckles. Flat seams shall not be less than 1/2" wide single locked and solder sweated or double locked and malleted flat or as shown on the Drawings.

g. Expansion joints shall be made with splice plates single locked.

h. All work shall be of the highest quality performed by workmen skilled in this trade. The work involved shall be completely waterproof and shall not invalidate any required bonds and guarantees.

i. After completion, all exposed work shall be thoroughly cleaned of all scraps, stains and dirt. After cleaning, the metal shall be washed with clean water and wiped dry. Flux shall be removed and excess neutralized to prevent staining.

END OF SECTION

SECTION 07 90 00
SEALANTS

PART 1: GENERAL

1.1 RELATED DOCUMENTS:

a. Drawings and general provisions of Contract, including General and Supplementary General Conditions and Division 1 Specification Sections, apply to work of this Section.

1.2 SCOPE:

a. Related Work Specified Elsewhere:

1. Unit masonry (Section 04 20 00).
2. Flashing and sheet metal (Section 07 62 00).
3. Hollow metal frames (Section 08 11 00).
4. Glazing (Section 08 80 00).

b. Work Included This Section: Caulking and sealant work as shown on Drawings, as specified and as required for a watertight facility. Include all supplementary materials and installation accessories required for a complete and proper installation.

1.3 INDUSTRY STANDARDS:

a. Some products and execution are specified in this Section by reference to published specifications or standards of the following (with respective abbreviations used). Reference is to the latest edition of the standard referenced.

American Society for Testing and Materials (ASTM)
American National Standards Institute (ANSI)

1.4 SUBMITTALS:

a. Installation Instructions: Submit duplicate copies of manufacturer's written instructions for installation of sealants specified.

b. Manufacturer's Data: Submit manufacturers printed data for the sealants specified. Data shall show test results of the physical properties of the materials. Submit all data regarding joint design bringing to the Architect's attention any conditions shown on the Drawings under which the specified material cannot be satisfactorily installed.

c. Samples: Submit samples of the full range of manufacturer's colors for selection of project colors by the Architect. As specified in Part 2 of this Section, custom colors may be required at no additional cost to the Owner.

d. Schedule of Colors: Submit schedule showing where selected colors of sealant are to be installed for approval by the Architect.

e. Guarantee-Warranty:

1. Submit guarantee-warranty on products and execution of sealant work required by this Section. Guarantee-warranty shall be submitted on applicator's company letterhead and shall be signed by an officer of the company. Guarantee-warranty shall be countersigned by the General Contractor.

2. Warranty shall state that work complies with requirements of the Contract Documents.

3. Guarantee shall state that work of this Section shall be repaired or replaced in case of failure and that any materials or finishes of the building damaged by failure of work of the Section will be repaired or replaced. The guarantee period shall be 24 months following date of final acceptance. Repair or replacement shall be performed at no additional cost to the Owner.

f. Compatibility and Adhesion Test Reports: From sealant manufacturer indicating the following:

1. Materials forming joint substrates and joint-sealant backings have been tested for compatibility and adhesion with joint sealants.

2. Interpretation of test results and written recommendations for primers and substrate preparation needed for adhesion.

1.5 QUALIFICATIONS:

a. Source: Products for use on this Project shall be of one manufacturer unless noted specifically otherwise herein.

b. Applicators: Submit letter from manufacturer of sealant materials stating that applicator is approved by the manufacturer for application of the materials specified for the Project. Letter shall certify that the applicator has satisfactorily applied the types of materials specified on projects which have been completed for at least 5 years. Letter shall be on manufacturer's letterhead and shall be signed by an officer of the company.

1.6 PRODUCT HANDLING:

a. Delivery of Materials: Materials shall be delivered to the project site in manufacturer's original, unopened containers with manufacturer's brand name clearly marked thereon.

b. Storage: Store containers in dry conditioned space.

1.7 ENVIRONMENTAL CONDITIONS:

a. Do not apply sealant to materials whose surfaces are damp, wet or exceed the temperature requirements stated herein or recommended by the sealant manufacturer.

b. Weather: No sealant materials shall be applied in wet weather nor when the threat of rain exists within 12 hours.

c. Temperature: Shall be 40 degrees F. and rising or above with no chance of freezing until the sealant materials have had a chance to properly set up and dry. No sealant materials shall be applied when the air temperature is below 40 degrees F. unless surfaces are heated and dried by approved means.

PART 2: PRODUCTS

2.1 MATERIALS: Note that the words "Sealant" and "Caulking" are used interchangeably. Comply with locations specified for the various types of materials.

a. Use the following sealants for general sealing and caulking work at locations other than specific locations itemized in Paragraph b. hereinafter. See Part 3 of this Section for required locations for the various types of sealants.

1. Urethane Sealant:

(a) Compound shall be a multi-component non-sag urethane sealant. Compound shall meet ASTM C 920. Color will be selected by the Architect to match adjacent materials and shall be a custom color at no additional cost to the Owner.

(b) Compound shall be one of the following, or equal approved in writing by the Architect:

"Dynatrol II" as mfd. by Pecora Corp.

"Sikaflex-2C NS EZ Mix+" by Sika Corporation

2. Silicone Based Sealant:

(a) Compound shall be a one-part, silicon-based sealant compound which meets the requirements of ASTM C 920. **Color will be selected by the Architect to match adjacent materials and shall be a custom color at no additional cost to the Owner.**

(b) Compound shall be one of the following, or equal approved in writing by the Architect:

"790 Building Sealant" as mfd. by DOWSIL

"795 Building Sealant" as mfd. by DOWSIL

"864 Silicone" as mfd. by Pecora

"890 Silicone" as mfd. by Pecora

"Spectrum 2" as mfd. by Tremco

“Sikasil WS-305 AM” as mfd. by Sika

“Sikasil WS-395” as mfd. by Sika

3. Self-Leveling Type Sealant:

(a) Compound shall be a two-part polyurethane based compound which meets the requirements of ASTM C 920. Color will be selected by the Architect.

(b) Compound shall be one of the following, or equal approved in writing by the Architect:

“Urexpan NR-200” as mfd. by Pecora Corporation

“DynaTrol II-SG” as mfd. by Pecora Corporation

"Sikaflex-2C SL" by Sika Corporation

"Vulkem 445 SSL" by Tremco.

4. Latex Caulking Compound:

(a) Caulking shall be an acrylic-latex compound and shall be one of the following, or equal approved in writing by the Architect. Color will be selected by the Architect to match adjacent materials and shall be a custom color at no additional cost to the Owner.

"AC-20 + Silicone" as mfd. by Pecora Corp.

"Tremflex 834" as mfd. by Tremco.

b. Primer: Provide primer recommended by sealant manufacturer.

c. Joint Sealant Backing:

1. General: Provide sealant backings of material and type which 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.

2. Plastic Foam Joint Fillers: Preformed, compressible, resilient, nonwaxing, nonextruding strips of flexible, nongassing plastic material described below, non-absorbant to water or gas, and of size, shape and density to control sealant depth and otherwise contribute to producing optimum sealant performance.

(a) Either open-cell polyurethane foam or closed-cell polyethylene foam, unless otherwise indicated, subject to approval of sealant manufacturer, for cold-applied sealants only.

3. Elastomeric Tubing Joint Fillers: Neoprene, butyl, EPDM, or silicone tubing complying with ASTM D 1056, nonabsorbent to water and gas, capable of remaining resilient at temperatures down to -26 deg F (-15 deg C). Provide products with low compression set and of size and shape to provide a secondary seal, to control sealant depth, and otherwise contribute to optimum sealant performance.

4. Bond-Breaker Tape: Polyethylene tape or other plastic tape as recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint filler materials or joint surfaces at back of joint where such adhesion would result in sealant failure. Provide self-adhesive tape where applicable.

PART 3: EXECUTION

3.1 PROJECT INSPECTION:

a. Prior to the application of any sealant compound, a manufacturer's representative shall visit the project site with the Contractor and the Architect and shall instruct the Contractor's applicator in the proper procedures of handling and applying their product to the materials involved. After application, the manufacturer's representative shall inspect the sealant work and shall notify the Architect in writing of his findings.

b. Prime all surfaces prior to applying sealant.

3.2 LOCATIONS OF SEALANTS:

a. Seal all joints of materials on the exterior of the building and where otherwise shown or required to provide a watertight installation. Seal interior joints as shown and specified. Install interior sealant and caulking work as shown and specified and in accordance with established standards of the trade.

b. Unless otherwise specifically shown on the Drawings, the following types of caulking and sealant compounds shall be used in the following locations:

1. Interior General Use - Latex Caulking Compound.

2. Exterior General Use Not Specified Otherwise - Urethane Sealant.

3. Exterior Horizontal Pavement Expansion Joints - Self-Leveling Type Urethane Sealant.

4. Vertical or Horizontal Expansion or Control Joints in Walls - Urethane Sealant.

5. Roof Flashing and Trim - Silicone or Urethane Sealant.

6. Windows - Silicone Sealant.

7. Metal, Glass and Other Nonporous Surfaces - Silicon Sealant.

8. Masonry, Concrete and Other Porous Surfaces - Urethane Sealant.

9. Vertical or Horizontal Expansion or Control Joints in Masonry Walls - Urethane Sealant.

3.3 JOINTS:

a. Joint tolerances and design shall be as recommended by the sealant manufacturer. Where joint dimensions and tolerances recommended by the sealant manufacturer are more restrictive than those specified herein, the manufacturer's requirements shall govern.

b. Joints to receive silicone-based sealants shall not be less than 1/4" in width nor greater than 5/8" in width. Sealant shall be installed to a thickness of 1/8" minimum and /8" maximum. Sealant shall be installed so that it adheres and bonds only to the sides of the joint and not to joint backing.

c. Joints to receive urethane-based sealants shall not be less than 1/4" nor more than /4" in width. Joint depth for joint widths up to 1/2" shall be the same as the joint width. For joints over 1/2" wide, joint depth shall be approximately 1/2 the width but not more than 1/2".

d. Joints to receive self-leveling sealant shall not be less than 1/4" wide nor greater than 2". Joints depth shall not be less than 1/4" deep nor greater than 1" deep with full-joint depth filled with sealant.

e. Interior caulking shall be installed only where shown on the Drawings or specified under the various Sections of these Specifications. Caulking of material joints to close construction errors or joints not shown on the Drawings shall be permitted only upon written approval by the Architect.

f. Where shown on the Drawings or called for in the Specifications, latex caulking joints shall not be less than 1/4" nor greater than 1/2" with a depth of 1/2 the face width and with caulking material installed the full depth of the joint.

g. Where joint depth exceeds that specified herein, fill with filler rod specified for specific sealant to provide proper depth.

3.4 PREPARATORY WORK:

a. Clean all joints of all contaminants and impurities. Concrete form release agents, water repellents, concrete laitance, and other surface treatments and protective coatings are examples of materials which must be removed from the joint surfaces to obtain proper sealant adhesion.

b. Porous substrates shall be cleaned where necessary by grinding, saw cutting, blast cleaning (sand or water), mechanical abrading or a combination of these methods as required to

provide a sound clean surface for sealant application. Dust, loose particles, etc. shall be blown out of joints with oil-free compressed air or vacuum cleaned.

c. Metal and glass surfaces shall be cleaned by wiping a solvent saturated clean cloth over only those surfaces to which sealant will be applied. A dry, clean cloth shall be used to remove the cleaning solvent from the surface.

d. For plastic, painted and other coated surfaces, the manufacturer shall be consulted to determine the proper cleaning solvent.

e. Greases, protective films and coatings, dust, oil, water, surface dirt and rust are examples of contaminants which must be removed.

f. Cleaning of all surfaces shall be done on the same day in which the sealant is installed.

3.5 PRIMING:

a. In addition to the recommended surface preparation steps, it may be necessary to prime concrete, masonry or other porous surfaces due to the extreme surface variability encountered on a job-to-job basis. If, in the opinion of the sealant manufacturer, joint surfaces are weak or contaminated, he shall recommend a primer for use with his sealant product to be applied on this Project.

b. Apply primer only in accordance with each sealant manufacturer's printed recommendations.

3.6 APPLICATION OF JOINT FILLER:

a. Joints where a backstop has not been provided shall be packed with a joint filler rod to within 1/2" of the surface.

b. Install a breaker-strip of polyethylene film at back of joint where filler rod cannot be used to prevent bond of caulking or sealant compound to back of joint.

3.7 APPLICATION OF SEALANT:

a. Install in strict accordance with manufacturer's printed instructions.

b. Apply sealant compound with gun having proper size nozzle or with knife as required.

c. See requirements of other Sections of these Specifications.

d. Use sufficient pressure to fill all voids and joints solid and to engage compound to sides of joint. A superficial skin or fillet bead will not be acceptable.

e. Remove excess compound and leave surfaces neat, smooth and clean. Joints shall be even and uniform in appearance and shall be watertight. Tool surface to produce good contact, to increase density and to improve appearance. Use masking tape to insure a neat appearance where required; mask only the protected area and remove before sealant begins to cure.

f. Apply sealant compound in a continuous operation, horizontally in one direction and vertically from the bottom to the top. At framed openings, apply continuously around turns and corners to completely fill corners.

g. At completion, all sealed or caulked surfaces shall present a neat appearance and all surrounding surfaces shall be left in a clean condition.

h. All control joints shall be sealed. Seal control joints with traffic bearing sealant with a shore hardness of d40 and a minimum movement capacity of 20%. Sealant must be compatible

with floor finishes. Where self-leveling sealant compound is used, the edges of the joint shall be protected by a non-staining, easily removed tape. After joint is filled with sealant compound, the tape shall be removed.

3.8 CLEAN-UP:

a. Upon completion of work, remove all boxes, cartridges and other debris. Clean sealant spillage from all adjacent surfaces.

END OF SECTION

SECTION 08 11 00
HOLLOW METAL DOORS AND FRAMES

PART 1: GENERAL

1.1 RELATED DOCUMENTS:

a. Drawings and general provisions of Contract, including General and Supplementary General Conditions and Division 1 Specification Sections, apply to work of this Section.

1.2 SCOPE:

a. Related Work Specified Elsewhere:

1. Sealants (Section 07 90 00)
2. Door and frame schedule (See Drawings).
3. Door hardware (Section 08 71 00).
4. Glass and Glazing (Section 08 80 00)
5. Field painting of doors and frames (Section 09 91 00).

b. Work Included This Section:

1. Hollow metal doors and frames as shown on Drawings and as specified. See Drawings and schedules for types, sizes, design and location of hollow metal doors, frames and accessories.

(a) Work of this Section includes field application of bituminous paint to inside of frames full height from floor, as specified in Part 2 of this Section.

2. Fire rated doors and frames with smoke seals.

3. Include all supplementary materials and installation accessories required for a complete and proper installation.

1.3 INDUSTRY STANDARDS:

a. Some products and execution are specified in this Section by reference to published specifications or standards of the following (with respective abbreviations used). Reference is to the latest edition of the standard referenced.

American National Standards Institute (ANSI)
American Society for Testing and Materials (ASTM)
Underwriter's Laboratories Inc. (UL)
Steel Door Institute (SDI)
National Fire Protection Association (NFPA)

1.4 QUALITY ASSURANCE:

a. Steel Door & Frame Standard: Provide doors and frames complying with American National Standard Institute “Recommended Specifications Standard Steel Doors and Frames" (ANSI 250.8), (formerly SDI 100) except where requirements specified are more stringent.

b. Fire Rated Door Assemblies: Assemblies complying with NFPA 80 and (UL) UL 10C-98 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction.

1.5 QUALIFICATIONS:

a. Source: Products for use on this Project shall be of one manufacturer for each function unless noted specifically otherwise.

1.6 SUBMITTALS:

a. Shop Drawings: Show typical construction and arrangement of all items. Show conditions at doors and frames in various wall thicknesses and materials. Show hardware reinforcement, anchors and sill clips. Show thicknesses of all metal. Include a schedule listing the location in the building of each item.

b. Product Data: For each type of door and frame indicated.

1.7 PRODUCT HANDLING:

a. Storage:

1. Stack and store frames properly to prevent warpage and other damage. Store doors in vertical position, spaced by blocking to permit circulation of air.

2. Upon delivery, touch up damaged areas of finish with rust inhibitive metal primer specified in Section 09910 for specific exposure of door in final location.

PART 2: PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS: Subject to compliance with the Drawings and Specifications, provide product by one of the following, or equal approved in writing by the Architect:

Amweld Building Products Inc.
Ceco Door Products
Curries Co.
Fleming
Metal Products Inc.
Republic Builders Products
Steelcraft/Div. American Standard Co.

2.2 MATERIALS:

a. Steel:

1. Cold-Rolled Steel Sheets: ASTM A 366, Commercial Steel (CS), or ASTM A 620, Drawing Steel (DS), Type B.

2. Metallic Coated Steel Sheets: ASTM A 653, Commercial Steel (CS), Type B, with A60 zinc-iron-alloy coating.

3. Steel for face sheets of hollow metal doors and for frame faces shall be stretcher leveled.

b. Shop Coating:

1. After fabrication, apply rust-inhibiting enamel or paint, either air-drying or baked, suitable for the substrate and as a base for the specified field applied finish paint, complying with ANSI A250.10, “Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames.”

2.3 DOORS:

a. General: Provide door sizes, thicknesses, and designs indicated.

b. Exterior Doors: Provide doors complying with requirements indicated below by referencing ANSI 250.8 for level and model and ANSI A 250.4 for physical endurance level:

1. Extra Heavy Duty.

2.4 FRAMES:

a. General: Provide steel frames for doors, transoms, sidelights, borrowed lights, and other openings that comply with ANSI A 250.8 and with details indicated for type and profile Conceal fastenings, unless otherwise indicated.

b. Frames of 14-gauge steel sheet for:

1. Level 3 steel doors.

c. Door Silencers: Except on weather stripped frames, drill stops to receive 3 rubber silencers on strike jambs of single door frames and 2 silencers on heads of double swing frames.

d. Plaster Guard: Provide minimum 26-gauge galvanized plaster guards or mortar boxes to close off interior of openings; place at back of hardware cutouts where mortar or other materials might obstruct hardware operations.

e. Supports and Anchors: Fabricated from not less than 18-gauge electrolytic zinc-coated or metallic coated steel sheet.

f. Inserts, Bolts, and Fasteners: Manufacturer’s standard units. Where zinc coated items are to be built into exterior walls, comply with ASTM A 153, Class C or D as applicable.

2.5 FABRICATION:

a. General: Fabricate steel door and frame units to comply with ANSI 250.8 and to be rigid and free from defects including warp and buckle.

b. Hollow Metal Frames:

1. Fabricate frames generally to dimensions and profiles shown on the Drawings except that it shall be the Contractor's responsibility to verify all hollow metal frame throat sizes based upon the partition or wall types

and thicknesses shown on the Drawings. Frames for sidelights, transoms and fixed glass windows shall conform to the requirements for door frames specified.

2. Frames shall be manufactured from cold rolled steel. Fabricate frames from 14-gauge steel for exterior locations.

3. Corner joints shall have contact edges closed tight. Miter face. Cope backbend, rabbet and stops. **Continuously weld backbend, face, stop and rabbets.** Exterior and interior frames shall be fully welded. Knock down type frames will not be acceptable. Grind exposed welds smooth and with no depressions.

4. At hardware locations, install reinforcing plates of the following minimum gauges:

   (a) Hinge and pivot reinforcements: 10-gauge (1 1/4" x 10" minimum size).

   (b) All other mortised and surface mounted hardware: 14-gauge.

5. Weld reinforcement plates to inner surface of frame with a minimum of 6 welds per plate.

6. At fully templated hardware, mortise, reinforce, drill and tap frames to receive hardware in accordance with hardware manufacturer's templates. Install reinforcements furnished by hardware supplier in accordance with hardware manufacturer's templates furnished with reinforcement, except as modified.

7. Provide a minimum of 3 anchors in each jamb. For frames over 7’-2" in height, provide an additional anchor for each 2' of height. Fabricate anchors from minimum 14-gauge steel. Anchors shall be appropriate type for wall material.

8. Provide floor clips of not less than minimum 16-gauge steel for frames. Fasten to bottom of frame for anchoring frame to floor construction.

9. Before shipment, install a temporary spreader at bottom of frames. Do not remove until frames are secured in place.

10. After fabrication, apply shop coats as follows:

    (a) Exterior frames shall be fabricated from galvanized or galvannealed and phosphatized sheet. Touch up weld areas and areas where zinc coating has been damaged with zinc rich primer. Apply shop primer finish equal to type specified.

    (b) Finished surfaces shall be smooth and free of irregularities.

11. Field Applied Bitumastic Paint: Field apply a heavy coat of bitumastic paint full height on the inside of all frames to prevent rusting of this surface during the construction period. Apply this paint as soon as possible after receipt of frames at the site.

12. Door Numbers on Frames: Frames shall have the door number (shown on the Architectural Floor Plans of the Drawings) permanently marked on a center hinge reinforcement.

13. **All frames scheduled to receive heavy weight hinges shall have high frequency hinge straps welded at top and bottom of each hinge reinforcement.**

14. **Where smoke seals, sound seals, or weatherstripping are called for, furnish kerfed type frame profile with gasketing suited to the required condition.**

c. Hollow Metal Doors:

1. Doors shall be flush type, 1 3/4" thick, formed of stretcher leveled, cold rolled steel sheets with core as specified, 16-gauge for exterior doors.

2. All exterior doors shall be fabricated from galvanized or galvannealed and phosphatized steel sheet specified in Paragraph 2.1.

3. Finished work shall be free from warpage, bulge or buckle. Corner bends shall be true, straight and sharp. Doors shall have no visible seams or joints on faces or stile edges.

4. Core: Use one of the following core materials that produces a door complying with SDI standards.

(a) Honeycomb Core: A honeycomb core consisting of a resin impregnated Kraft paper cellular structure shall be laminated to the inside of both face sheets with an adhesive. The honeycomb material shall have a crushing strength of not less than 4000 lbs. per sq. ft. (psf) and the lamination shall withstand not less than 1100 psf in shear.

(1) All hollow metal doors are to have this honeycomb core except where the polystyrene core is specified below and where fire rated doors are required.

(b) Polystyrene Core: A rigid core of polystyrene foam board shall be bonded to face sheets with an adhesive. Compressive strength of core shall not be less than 1500 psf and a shear strength of not less than 18 psi. The strength of the bond between the polystyrene and the steel face sheets shall exceed the strength of the polystyrene, so that delamination does not occur under any operating conditions.

(1) All exterior hollow metal doors and all hollow metal doors scheduled to receive acoustical seals (see Door Schedule on Drawings and Section 08710 - Finish Hardware) are to have this polystyrene core.

(c) Core for Fire Rated Doors: See Paragraph "Fire Rated Doors and Frames."

5. Join faces at stile edges by a continuous weld extending full height of door. Welds shall be ground, filled and dressed smooth to make them invisible and to provide a smooth, flush surface.

6. Close top and bottom edges of interior doors with a continuous, recessed steel channel of not less than 16-gauge sheet steel. Close top and bottom edges of exterior doors flush (not recessed) as integral part of door construction or by addition of minimum 16-gauge inverted steel channels. Extend channels full width of door and spot weld to both faces. Space holes in bottom closure of exterior doors to permit escape of entrapped moisture.

7. Provide profiles on both stiles of door as follows:

   (a) Single Acting Swing Doors: Beveled 1/8" in 2".

8. Mortise, reinforce, drill and tap doors at factory for fully templated hardware in accordance with approved hardware schedule and with templates supplied by the hardware supplier. Reinforcements shall be welded within door. Where surface mounted hardware is to be applied, provide only reinforcing plates in door. Drilling and tapping for hardware will be done during installation of such hardware in the field, unless noted specifically otherwise in the Contract Documents.

9. Provide reinforcing plates for hardware of the following minimum gauges:

   (a) Hinges and pivot reinforcement: 10-gauge

   (b) Reinforcement for lock face, flush bolts, concealed holders, concealed and surface mounted closers and other hardware: 14-gauge

   (c) Reinforcement for push, pull and kick plates: 16-gauge

10. **Hinge and lock stiles shall be a continuous 14 gauge (minimum) integral channel used to form reinforcements.**

11. Factory Finish: Treat all surfaces chemically to insure cleaning and maximum adhesion of finish. Install shop coat of primer complying with ANSI 250.10 for acceptable criteria and equal to types specified for galvanized, galvannealed or non-galvanized surfaces

c. Door Louvers:

1. Louvers built into doors shall be thickness of door, with inverted "V" blades fabricated from minimum 16 gauge cold rolled steel sheet. Door faces shall frame louver blades. Seal at edges to prevent penetration of water.

2. Where required, provide insect screen installed over inside face of louvers and in a removable channel frame. Screen shall be 16 x 18 mesh aluminum screen with black paint finish.

d. Fire Rated Doors and Frames: Where fire rated doors and frames are indicated or required, provide fire rated door and frame assemblies that comply with NFPA 80 "Standard for Fire Doors and Windows", and have been tested, listed, and labeled in accordance with ASTM E 2074, by Underwriter's Laboratories or other nationally recognized independent testing and inspection agency acceptable to authorities having jurisdiction. Doors and frames shall bear the required label

permanently attached on the hinge side. Door core shall be type standard with the door manufacturer and as tested and certified to bear the required UL label.

PART 3: EXECUTION

3.1 COORDINATION:

a. Coordinate the installation of metal doors and frames with the work of other trades. Coordinate operating hardware templates to ensure that doors and frames are properly reinforced in the factory to receive the specified hardware. Verify specific location and type of hardware as required in Section 087100 and Door Schedule on Drawings.

3.2 INSTALLATION:

a. General: Install steel doors, frames, and accessories according to Shop Drawings, manufacturer's data, and as specified.

b. Placing Frames: Comply with provisions in SDI 105, unless otherwise indicated. Install frames plumb, rigid and in true alignment and in accordance with the manufacturer's written instructions and shop drawings approved by the Architect. Brace properly until built into wall.

1. Inspect frames for plumbness and correct positioning before being anchored into wall. Frames installed out of correct position shall be torn out and replaced.

2. Secure door frames to floor with a countersunk expansion device at each jamb. Build anchors into walls as the work progresses.

3. Frames installed in masonry or concrete walls shall be filled tight with masonry mortar. Install silencers prior to filling frame.

4. Install exterior frames with 1/4" to 3/8" joint between frame and wall to receive backer rod and sealant in accordance with Section 07900 - Sealants. Interior frames shall be installed tight against adjacent construction and shall be caulked around the entire perimeter to fill minor spaces between the frame and wall.

5. Install fire-rated frames according to NFPA 80.

c. Door Installation: Comply with ANSI 250.8. Hang metal doors plumb and true, with doors making uniform contact with metal frame stops on all sides. Metal doors that cannot be hung to fit evenly on all sides shall be removed and replaced.

1. Install fire-rated doors within clearances as specified in NFPA 80.

2. Doors designated on door shop drawings to be undercut are specified to be factory undercut. Only the minimum amount of job fitting and machining shall be allowed on doors. All doors shall be accurately fitted to their opening and accurately machined for their hardware. In addition, pairs of doors shall have a gap at meeting stiles not exceeding 1/8" at closest point of bevel. Slope of bevel shall not exceed 1/8" in 2".

3. All hardware is furnished under Section 08710. Application of hardware to doors and frames is specified under this Section. The requirements of Section 087100 shall apply to the installation of the door hardware.

4. Receive, store, and be responsible for the door hardware to be installed under this Section. Properly tag, index, and file all keys until turned over to the Owner.

5. Apply hardware in accordance with templates and manufacturer's instructions; mortise and fit accurately, apply securely, and adjust carefully. Exercise care not to injure work when applying hardware. Where butt hinges are applied to wood doors, the door shall be predrilled for a full threaded No. 12 wood screw. Coordinate with shop drawings and Contract Drawings for proper location.

6. Doors shall be finished under Section 099100. Colors to be selected by the Architect, it is the intention for the frames and doors to match adjacent surface colors. Remove doors so they may have their bottoms and tops sealed and finished and then rehang. Cover door hardware until painting is completed. Prior to completion of building, examine doors and hardware, adjust as required, and leave hardware in proper working order, free from defect.

7. ADA Adjustments: The maximum force for pushing or pulling open a door shall be as follows:

   a. Fire doors shall have the minimum opening force allowable by the appropriate administrative authority.

3.3 ADJUSTING AND CLEANING:

a. Prime Coat Touch-up: Immediately after installation, sand smooth any rusted or damaged areas of prime coat and apply touch up of compatible air-drying primer.

b. Protection Removal: Immediately before final inspection, remove protective wrappings from doors and frames.

END OF SECTION

SECTION 08 33 23
OVERHEAD ROLLING DOORS

PART 1: GENERAL

1.1 RELATED DOCUMENTS:

a. Drawings and general provisions of Contract, including General and Supplementary General Conditions and Division 1 Specification Sections, apply to work of this Section.

1.2 SCOPE:

a. Related Work Specified Elsewhere:

1. Miscellaneous metals (Section 05 50 00).
2. Door and frame schedule (See Drawings).

b. Work Included This Section:

1. Manually operated overhead rolling doors as shown on the Drawings and specified including all supplementary components and installation accessories necessary for a complete installation properly operating and ready for use.

1.3 INDUSTRY STANDARDS:

a. Some products and execution are specified in this Section by reference to published specifications or standards of the following (with respective abbreviations used). Reference is to the latest edition of the standard referenced.

The American Society for Testing and Materials (ASTM)

1.4 QUALIFICATIONS:

a. Distributor and Installer:

1. Doors shall be supplied and installed by a distributor that maintains fulltime installation and service crews within 250 miles of the project site. The distributor shall maintain a sufficient stock of parts for emergency service and shall warrant that service can be provided within 24 hours after notification.

1.5 SUBMITTALS:

a. Shop Drawings: Coordinate Drawings with adjacent work. Show location of anchors and other built-in items to be installed by others prior to delivery and installation of doors. Show required clearances at sides and overhead. Show location, arrangement, materials, finishes, hardware, accessories, connections, anchorage and relation to adjacent work.

b. Manufacturer's Data:

1. Submit manufacturer's printed physical data, test data on springs and specifications. Mark submittals to show specific data applicable to assemblies to be furnished.

2. Submit manufacturer's printed installation instructions.

c. Warranty of Service:

1. Submit a written "Warranty of Service" as required herein from the distributor-installer. Warranty shall be written on the company's letterhead and shall be signed by an officer of the company.

d. Guarantee-Warranty:

1. Submit a one-year guarantee-warranty on the counterbalance springs. Warranty shall state springs comply with or exceed requirements of the Contract Documents. Guarantee shall state that, if the counterbalance springs fail or break in the guarantee period of one year following final acceptance, the springs shall be replaced at no cost to the Owner for materials or labor. Guarantee-warranty shall be prepared on the company letterhead of the distributor-installer, signed by an officer of the company, and countersigned by the Contractor.

PART 2: PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS: Subject to compliance with the Drawings and Specifications, provide doors by one of the following, or equal approved in writing by the Architect:

Cornell Iron Works Inc. (Firemiser Insulated Rolling Fire Doors)
Overhead Door Corp. (Fireking Insulated Rolling Fire Doors)
Wayne Dalton Corp. (Firestar Insulated Rolling Fire Doors)

2.2 MATERIALS AND PERFORMANCE REQUIREMENTS:

a. General:

1. In order to describe type and quality of doors required, the Drawings and Specifications are based upon "Firemiser ERD20 Insulated Rolling Fire Door" by Cornell Iron Works. See Paragraph "Acceptable Manufacturers" for other acceptable manufacturers. It is not necessary for product by other listed manufacturers to be identical to the specified product in order to be acceptable, however it must be both similar and equal in the judgment of the Architect.

2. Doors are to be manually operated and will be interior face of wall mounted unless specifically shown otherwise on the Drawings.

3. R-Value: 4.5 minimum

4. UL Fire Rating: 0.75 hour minimum

5. Color: Gray, prefinished

b. Materials and Performance:

1. Curtain:

(a) Slats: Assembled of interlocking cold rolled formed galvanized steel front and back. Double skin interlocking roll formed interior and exterior metal slats are filled with 7/8" thick closed cell pressure foamed in place urethane insulation with a Flame Spread Index of 0 and a Smoke Developed Index of 10 as tested per ASTM E84.

(b) Endlocks: Each end of alternate slats to be fitted with endlocks to act as a wearing surface in the guides and to maintain slat alignment.

(c) Windload: Door construction designed to satisfy windload of 20 PSF or 87 MPH windload in the closed position.

(d) Gauge: Thickness of slat material to be as required by width of opening and windloading requirements, but not lighter than 22 gauge.

(e) Galvanized and Prime Coated: Zinc coated in accordance with ASTM A653 and factory baked on prime coat of paint.

(f) Bottom Bar: Curtain to be reinforced with a bottom bar consisting of two steel angles.

(g) Weather Seal: Provide the door manufacturer's standard weatherseal at the bottom bar to act as a weather seal at the floor.

2. Spring Counterbalance:

(a) Counterbalance: Housed in a steel pipe of diameter and wall thickness to restrict maximum deflection to .03" per foot of door width.

(b) Springs: To be helical torsion type designed to include an overload factor of 25% and for optimum ease of operation. Springs are to be grease packed and are to be mounted on a cold rolled steel inner shaft.

(c) Spring Tension: Adjustable from outside of end bracket plate.

(d) Ball Bearing: Sealed, to minimize wear of pipe shaft rotation around inner shaft.

3. Bracket Plates:

(a) Bracket Plates: Carrying pipe counterbalancing shaft are to be no less than 1/4" thickness and are to house ends of door coil.

(b) Drive End Bracket Plate: Fitted with a sealed ball bearing.

4. Guide and Wall Angle Assembly:

(a) Guide/Wall Angles: Structural steel angles of 3/16" minimum thickness.

(b) Depth of Guide: To provide adequate slat penetration to satisfy specified wind loading.

(c) Guide Weather Seal: Furnish the door manufacturer's standard guide weatherstripping to seal against face of the curtain slats.

5. Hoods:

(a) Hoods: To house coil are to be fabricated of 24-gauge galvanized steel and a round profile.

(b) Hood Baffle: Furnish the door manufacturer's standard hood baffle to minimize air infiltration.

6. Finish:

   (a) All surfaces exposed to view shall have factory baked on primer coat of epoxy modified polyester paint or equal primer paint standard with the door manufacturer.

7. Weatherstripping:

   (a) Include the door manufacturer's standard weatherstripping around all edges including hood baffle, astragal at bottom and guide weatherstripping.

8. Chain Operated

PART 3: EXECUTION

3.1 INSTALLATION:

a. Doors shall be installed by skilled mechanics experienced in the installation of the materials and equipment specified.

b. Install doors in accordance with the Drawings, these Specifications, the manufacturer's printed instructions and approved shop drawings.

c. Doors shall operate quietly and freely without binding and wracking.

d. Include all supplementary components and installation accessories required for a complete and proper installation, ready for use.

END OF SECTION

SECTION 08510
STEEL WINDOWS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Fire Rated Steel Windows (Fixed Lite) – 45-Minute UL Labeled

1.2 RELATED SECTIONS

A. Section 08800 – Glass, Glazing, and Glazing Materials

1.3 REFERENCES

A. ASTM A 569-(1991a; R 1993) Steel, Carbon (0.15 Maximum, Percent), Hot-Rolled Sheet and Strip Commercial Quality

B. ASTM A 653-(1994) Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process

C. ASTM B 633-(1985; R 1994) Electrodeposited Coatings of Zinc on Iron and Steel

D. ASTM B 766-(1986; R 1993) Electrodeposited Coatings of Cadmium

E. ASTM E 283-(1991) Determining the Rate of Air Leakage through Exterior Windows, Curtain Walls, and Doors Under Specific Pressure Differences Across the Specimen

F. ASTM E 330-(1990) Structural Performance of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference

G. ASTM E 547-(1993) Water Penetration of Exterior Windows, Curtain Walls, and Doors by Cyclic Static Air Pressure Differential

H. ASME B18.6.3- (1972; R 1991) Machine Screws and Machine Screw Nuts

I. ASME B18.6.4- (1981; R 1991) Thread Forming and Thread Cutting Tapping Screws and Metallic Drive Screws (Inch Series)

J. NFPA 80-(2007) Fire Doors and Windows

K. NFPA 101-(2006) Safety to Life from Fire in Buildings and Structures

L. UL9-Fire Tests of Window Assemblies

1.4 PERFORMANCE REQUIREMENTS (Based on a single window in a testing lab environment)

A. Fixed lite steel windows shall be designed to meet F-C30 voluntary specifications in AAMA/NWWDA 101/I.S.2-97 and be designed to meet the following performance requirements. Fire-rated windows shall bear the Underwriters Laboratories, Inc. label including the manufacturer's file number for the indicated rating.

1. Air Infiltration: Air infiltration shall not exceed .3 SCFM per square foot of window area at a static air pressure difference of 1.57 PSF as established by AAMA/NWWDA 101/I.S.2-97 when tested in accordance with ASTM E 283.

2. Water Resistance: When tested in accordance with ASTM E 547, there shall be no water leakage at a static air pressure difference of 4.50 PSF.

B. Fire Protective: Fire protective rating shall meet requirements as tested and classified by Underwriters Laboratories Inc, in accordance with UL-9. Products shall meet the requirements of Underwriters Laboratories Inc. The Listing Mark of UL on the product will be accepted as evidence of compliance.

C. Life Safety Criteria: Windows shall conform to NFPA 101 Life Safety Code when rescue and/or second means of escape are indicated.

1.5 SUBMITALS

A. Manufacturer's descriptive data and catalog cut sheets.

B. Drawings indicating elevations of windows, rough-opening dimensions for each type and size of windows, section details, fastenings, generic method of installation and anchorage, glazing details, method of glazing, muntin divider details, mullion details, weather-stripping details, types and locations of operating hardware, window type and indicating compliance with fire safety code, where required. Refer to Authority Having Jurisdiction for specific installation, wall detail, and anchorage requirements.

C. Manufacturer's preprinted installation instructions and cleaning instructions.

D. Manufacturer's standard color samples of painted finishes.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: Experienced in performing work of this section who has specialized in installation of work similar to that required for this project.

B. Manufacturer's Qualifications: A firm with not less than 10-years' experience in manufacture of similar type steel windows.

1.7 DELIVERY, STORAGE AND HANDLING

A. Delivery:

1. Manufacturer's original, unopened, undamaged containers, identification labels intact. Inspect for damage upon delivery.

2. Handle and store products according to manufacturer's recommendations.

B. Storage and Protection:

1. Store materials protected from exposure to harmful weather conditions and at temperature and humidity conditions recommended be manufacturer

2. Store windows to prevent damage or marring of finish. Store in shipping containers under cover on building site.

1.8 PROJECT CONDITIONS

A. Verify actual openings by field measurements before fabrication, show recorded measurements on shop drawings.

B. Coordinate field measurements and fabrication schedule with construction progress to avoid construction delays.

1.9 WARRANTY

A. Manufacturer's standard warranty to be 3 years from the date of shipping.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Basis of Design: Series 950 Fixed Lite Windows as manufactured by D.V. Fyre-Tec, Inc.

B. Architect approved equal.

2.2 STEEL WINDOW TYPES

A. Fixed Lite steel windows shall be designed for inside field glazing, and for glass types scheduled on drawings or otherwise specified. Units shall be complete with glass and glazing provisions to meet the requirements of paragraph WINDOW PERFORMANCE. Glazing material shall be compatible with steel and shall not require painting.

B. Fire-rated windows shall conform to UL-9 and shall be labeled with a 3/4 - hour fire-test rating as specified in the window schedule. Units shall be designed and fabricated to meet glass sizes, window sizes, and opening dimensions established by NFPA 80. Hardware shall conform to NFPA 80 requirements.

2.3 MATERIALS

A. Steel Frames and Inserts

1. Steel frames shall be fabricated from roll-formed galvanized lock-forming quality steel per ASTM A 653.

2. Frame corners shall be mitered and welded. Integral muntins where required shall be galvanized roll-formed material fitted and welded.

B. Installation Kits

1. Provide subframe installation kits for all windows.

C. Formed Component Parts

1. Formed component parts shall be hot-rolled sheet steel conforming to ASTM A 569, commercial quality with a minimum of 0.15 percent carbon.

2. Sheet steel shall be zinc coated (galvanized) by the hot-dip process in accordance with ASTM A 653 or ASTM A 924.

D. Screws and Bolts

1. Screws and bolts shall conform to ASTM B 766, ASME B18.6.3 and ASME B18.6.4.

E. Fasteners

1. Fastening devices shall be window manufacturer's design made from, cadmium-plated steel, zinc-plated steel, nickel/chrome-plated steel or magnetic stainless steel.

F. Window Anchors

1. Anchors for installing windows shall be stainless steel or hot-dip zinc coated steel conforming to ASTM A 123.

G. Glass and Glazing

1. Standard clear ceramic glass (1 hour rated)

2.4 FABRICATION

A. Fabricate windows in accordance with approved shop drawings.

B. Frame sections shall be one-piece sections with corners mitered, welded, and dressed smooth.

C. Required muntins shall be securely welded to the frame members and at all intersections.

D. All windows shall be designed for inside glazing.

E. All windows shall be factory glazed with UL labeled glass meeting or exceeding the hourly rating required for the frame label. Individual lites shall display a UL label permanently affixed and in accordance with the requirements of the International Building Code and NFPA 80.

2.5 FINISHES – All products will be provided with a paint coating.

A. Finish Coat – Manufacturer's Standard Color

1. Steel windows, fins, mullions, cover plates and associated parts shall be cleaned, pre-treated with iron phosphate and factory powder coated and cured with a manufacturer's standard color in a dry film thickness of not less than 0.050 mm (2.0 mil).

PART 3 EXECUTION

3.1 EXAMINATION

A. Window openings shall conform to details and dimensions shown on the approved shop drawings.

B. Notify the Architect immediately of conditions that may adversely affect the window installation. Correct conditions prior to installing windows.

3.2 INSTALLATION

A. Steel windows shall be installed in accordance with approved shop drawings and manufacturer's approved recommendations.

B. Fire-rated windows shall be installed in compliance with NFPA 80 and NFPA 101.

C. Steel surfaces in close proximity with masonry, concrete, wood, and dissimilar metals other than stainless steel, zinc, cadmium, or small areas of white bronze shall be protected from direct contact.

D. Verify that weep features at the bottom of the sills are opened at least 1/8” x 1”. Failure to do so may lead to premature finish failures and void warranty.

E. The completed window installation shall be watertight.

3.3 ADJUSTING AND CLEANING

A. Steel window finish and glass shall be cleaned on interior and exterior sides in accordance with window manufacturer’s recommendation. Alkaline, abrasive or brick wash agents shall not be used.

3.4 PROTECTION

A. Protect installed products and finished surfaces from damage during construction.

B. Touch-up any abraded surface of the window finish with air dry paint furnished by the window manufacturer.

END OF SECTION

SECTION 08 80 00
GLASS AND GLAZING

PART 1: GENERAL

1.1 RELATED DOCUMENTS:

a. Drawings and general provisions of Contract, including General and Supplementary General Conditions and Division 1 Specification Sections, apply to work of this Section.

1.2 SCOPE:

a. Related Work Specified Elsewhere:

1. Sealants (Section 07 90 00).
2. Hollow metal doors (Section 08 11 00).
3. Steel windows (Section 08 51 00).

b. Work Included This Section:

1. Glass and glazing as shown and specified.
2. All glass and glazing not specifically included in other Sections of the Specifications.
3. All accessory materials required for a complete and proper installation.

1.3 INDUSTRY STANDARDS:

a. Some products and execution are specified in this Section by reference to published specifications or standards of the following (with respective abbreviations used). Reference is to the latest edition of the standard referenced.

Underwriter's Laboratories Inc. (UL)
Flat Glass Marketing Association (FGMA)
National Bureau of Standards (NBS)
American Architectural Manufacturers Assn. (AAMA)

1.4 QUALIFICATIONS:

a. Manufacturers:

1. Standard: For purposes of designating type and quality for the work under this Section, Drawings and Specifications are based on products manufactured or furnished by manufacturers listed for specific products. Equal products by other manufacturers will be acceptable when approved in writing by the Architect.

2. Source: Products for use on this Project shall be one manufacturer for the same function unless noted specifically otherwise herein.

1.5 PRODUCT HANDLING:

a. Glazing compounds and accessories shall be delivered to the site in unopened containers, labeled plainly with the manufacturer's names and brands.

b. Glass and setting materials shall be stored in safe, dry locations and shall not be unpacked until needed for installation. Handling and installation of materials shall be in a manner that will protect them from damage.

1.6 ENVIRONMENTAL CONDITIONS:

a. Glazing work shall not be started until the outdoor temperature is above 40° F. on a rising thermometer, unless approved provisions are made to warm the glass and rabbet surfaces. Sufficient ventilation shall be provided to prevent condensation of moisture on glazing work during installation.

b. Glazing work shall not be performed during damp or rainy weather.

c. Glazing in gasket construction shall be governed by the requirements of the gasket manufacturer.

1.7 SUBMITTALS:

a. Shop Drawings: Show glazing with proposed setting systems for various glass framing and types of glass. Show relation to adjacent work. Show installation techniques and materials with large scale detail drawings.

b. Manufacturer's Data: Submit (in duplicate) manufacturer's printed data and installation instructions for each of the glass types specified hereinafter for approval before work is started.

c. Samples: Submit 12" x 12" factory labeled samples of each type of glass specified and representative samples of glazing materials and accessories specified or proposed to be used.

d. Guarantees:

1. Submit a 10-year guarantee on all glass specified in this Section. The guarantee shall include, but not be limited to, the following:

(a) Water leaks.
(b) Breakage due to faulty installation or thermal failures.
(c) Delamination of glass and coating.
(d) Spontaneous breakage.
(e) Loose or faulty installation.
(f) Noncompliance with ANSI Standard Z97.1
(g) Labels or identification in exposed to view areas, except for those required by code or governing authorities.
(h) Failure to meet performance requirements of Specification.

e. Internal Stress Calculations: For each type of glass used on the exterior of the building, submit calculations by the glass manufacturer or fabricator showing internal stresses to be expected in the glass under direct sunlight, instantaneous differential shading, and other stressful environmental conditions that will exist after completion of the building. These calculations should illustrate that the glass, when installed as shown and specified, will not develop internal stresses of such magnitude that spontaneous breakage will occur. If the Contractor fails to notify the Architect, in writing with this submittal, that spontaneous breakage due to internal stresses is likely to occur if the glass is installed as shown and specified, then the Contractor will be responsible in the event that spontaneous breakage does occur.

PART 2: PRODUCTS

2.1 MATERIALS:

a. Types of Glass:

1. Laminated, Fire-Rated Glass: 5/16" thick, clear (no wires allowed), UL rated for 45 minutes for 1296 sq. in. maximum area and 3 hours for 100 sq. in. maximum area. Fire-rated glass is to be FireLite Plus glass distributed by Technical Glass Products. FireLite Plus glass shall be glazed with Metacaulk, a fire-rated UL listed glazing compound furnished by the glass distributor.

b. Elastomeric Glazing Sealants and Preformed Glazing Tapes:

1. General: Provide products of type indicated and complying with the following requirements:

(a) Compatibility: Select glazing sealants and tapes of proven compatibility with other materials with which they will come into contact, including glass products, seals of insulating glass units, and glazing channel substrates, under conditions of installation and service, as demonstrated by testing and field experience.

(b) Suitability: Comply with recommendations of sealant and glass manufacturers for selection of glazing sealants and tapes which have performance characteristics suitable for applications indicated and conditions at time of installation.

(c) Elastomeric Sealant Standard: Provide manufacturer's standard chemically curing, elastomeric sealant of base polymer indicated which complies with ASTM C 920 requirements, including those for Type, Grade, Class and Uses.

(d) Colors: Provide color of exposed sealants indicated or, if not otherwise indicated, as selected by Architect from manufacturer's standard colors.

2. Preformed Butyl-Polyisobutylene Glazing Tape: Provide manufacturer's standard solvent-free butyl-polyisobutylene formulation with a solids content of 100 percent; complying with AAMA A 804.1; in extruded tape form; non-staining and non-migrating in contact with nonporous surfaces; packaged on rolls with a release paper on one side; with or without continuous spacer rod as recommended by manufacturers of tape and glass for application indicated.

c. Glazing Gaskets:

1. Lock-Strip Gaskets: Neoprene extrusions of size and shape indicated, fabricated into frames with molded corner units and zipper lock strips, complying with ASTM C 542; black.

2. Dense Elastomeric Compression Seal Gaskets: Molded or extruded gaskets of material indicated below, complying with ASTM C 864, of profile and hardness required to maintain watertight seal:

Neoprene
EPDM
Thermoplastic polyolefin rubber
Any material indicated above

3. Cellular Elastomeric Preformed Gaskets: Extruded or molded closed cell, integral-skinned neoprene of profile and hardness required to maintain watertight seal; complying with ASTM C 509, Type II; black.

d. Miscellaneous Glazing Materials:

1. Compatibility: Provide materials with proven record of compatibility with surfaces contacted in installation.

2. Cleaners, Primers and Sealers: Type recommended by sealant or gasket manufacturer.

3. Setting Blocks: Neoprene, EPDM or silicone blocks as required for compatibility with glazing sealants, 80 to 90 shore A durometer hardness.

4. Spacers: Neoprene, EPDM or silicone blocks, or continuous extrusions, as required for compatibility with glazing sealant, of size, shape and hardness recommended by glass and sealant manufacturers for application indicated.

5. Edge Blocks: Neoprene, EPDM or silicone blocks as required for compatibility with glazing sealant, of size and hardness required to limit lateral movement (side-walking) of glass.

6. Compressible Filler Rods: Closed-cell or waterproof-jacketed rod stock of synthetic rubber or plastic foam, flexible and resilient, with 5-10 psi compression strength for 25 percent deflection.

e. Manufacturer's Labels:

1. Labels showing strength, grade, thickness, type and quality will be required on each piece of glass. Labels must remain on glass until it has been set and inspected.

2. When glass is not cut to size by the manufacturer and it is furnished unlabeled from local stock, the Contractor shall submit an affidavit stating the quality, thickness, type and manufacturer of the glass furnished.

PART 3: EXECUTION

3.1 INSTALLATION:

a. Glazed Openings - General:

1. Do not set glass until rabbets have been primed nor until prime coat is dry.

2. Remove greases, lacquers and other organic protective finishes from surfaces receiving glazing compound.

3. All glazing shall be done in accordance with the "Glazing Manual" and "Sealant Manual" of the Flat Glass Marketing Association. Use setting blocks. Observe clearance requirements of manufacturer of glass and as recommended in the FGMA Glazing Manual.

4. Where resilient gaskets are furnished with the doors or framing members, install glass in accordance with written instructions of manufacturer of glazing section.

5. Install glazing materials and accessories in accordance with printed installation instructions of manufacturer.

6. Glass sizes shall be field measured to provide the required edge clearances for the type of glass to be installed.

7. Glazing work shall produce sealed weathertight installation. At completion of work, leave glass clean, tightly placed, whole and free from cracks and rattles.

8. In other Sections of the Project Manual where glazing is specified to be furnished and installed under those Sections, more stringent installation requirements may be specified and shall govern the glazing installation within that Section.

b. Glazing for Steel Windows:

1. Install glazing units on 2 resilient neoprene setting blocks spaced at quarter points of sill and of sufficient length to support glazing. Height of setting blocks must be adjusted for proper perimeter clearance.

2. Apply pre-shimmed glazing tape at exterior face of glass prior to setting glass in place. Apply tape in one continuous piece with joint at top of glass. Apply glazing tape accurately to allow for a minimum of 1/8" silicone sealant joint.

3. Provide heel bead sealant at sill corners.

4. Install snap-on glazing bead with neoprene compression gasket on interior face of glass.

5. Lock windows into place after glazing.

3.2 CLEANING:

a. Upon approval of Architect, remove all labels and thoroughly clean all glass.

b. Remove glazing materials from adjacent surfaces with cleaner recommended by the manufacturer for each specific material.

END OF SECTION

SECTION 09 29 00
GYPSUM DRYWALL

PART 1: GENERAL

1.1 RELATED DOCUMENTS:

a. Drawings and general provisions of Contract, including General and Supplementary General Conditions and Division 1 Specification Sections, apply to work of this Section.

1.2 SCOPE:

a. Related Work Specified Elsewhere:

1. Wood framing, furring, and blocking (Section 06 10 00).
2. Flexible insulation including acoustical (Section 07 21 10).
3. Rigid insulation (Section 07 21 30).
4. Painting (Section 09 91 00).
5. Fire-rated GWB on metal roof deck (Section 07 53 00).
6. Light gauge metal framing (Section 05 40 00).

b. Work Included This Section:

1. Metal framing and furring for GWB ceilings and non-load-bearing interior GWB partitions. Note that light gauge metal framing (LGMF) for other uses is specified in Section 05 40 00.

2. Gypsum wallboard partitions, shaft walls, ceilings and elsewhere as indicated or specified.

3. Exterior gypsum wall sheathing.

4. All trim work and other accessories required for a complete and finished installation.

1.3 SUBMITTALS:

a. Manufacturer's Data: Submit in duplicate.

1. Manufacturer's technical data on materials and instructions for installing gypsum wallboard partitions and ceilings including light gauge metal framing.

1.4 PRODUCT HANDLING:

a. Delivery and Storage:

1. Deliver products in original wrapping and containers with labels intact.

2. Store gypsum products as recommended by manufacturer to prevent damage and wetting.

3. Store metal items in a dry location free from physical abuse.

PART 2: PRODUCTS

2.1 MANUFACTURERS: To identify type and quality of materials and workmanship intended, specifications are based on the products of manufacturers listed. Products and systems as

manufactured by the listed companies will be acceptable when submittals specified hereinafter are approved by Architect in writing.

a. Gypsum Board and Related Products:

Gypsum Division of Georgia-Pacific
National Gypsum Company
United States Gypsum Company (USG)
American Gypsum
Pabco Gypsum
CertainTeed

b. Steel Framing, Furring and Related Products:

Studco Building Systems
ClarkDietrich Building Systems
SCAFCO Steel Stud Company
Marino/Ware Industries Inc.
Super Stud Building Products Inc.
Steel-Con Steel Construction Systems
Mill Steel Framing
Cemco
MBA Metal Framing

2.2 MATERIALS:

a. Lightweight Framing:

1. Steel Studs for Non-Load-Bearing Interior Partitions: Cold-rolled from 20-gauge galvanized steel and designed for screw attachment of wallboard. Note UL gauges listed on the drawings are a minimum requirement, heavier gauge is required by this Specification. Studs at all door jambs and jambs at any wall opening over 3'-0" wide shall be doubled. Provide floor and ceiling runners of same gauge material as studs. See Drawings for stud sizes and shapes.

(a) Studs for shaft wall systems shall be 20-gauge galvanized USG Steel C-H Studs, or approved equal, with overall width shown on the Drawings or if not shown the manufacturer's standard width suitable for the indicated construction conditions. J-Runners, jamb struts and other required framing members shall be same gauge and finish as the studs.

b. Gypsum Wallboard: Provide thicknesses shown on the Drawings. For locations of the various types, see paragraph titled "Locations" in Part 3 of this Section.

1. Standard Wallboard: USG Sheetrock SW, with tapered edges.

2. Gypsum Wallboard with Vapor Barrier: Aluminum Foil-Back USG Sheetrock with vapor permeability not to exceed 0.06 perm per ASTM C 355.

3. Sheathing Board: USG Gypsum Sheathing.

c. Screws:

1. Wallboard: As recommended by manufacturer for specific application.

2. Steel Framing: Pan-head sheet metal screws, steel, cadmium-plated.

d. Control Joint: Control Joint No. 093.

e. Joint Compound:

1. For Cementing Tape: Durabond 90.

2. For Fill Coats: Ready Mixed Joint-Compound All-Purpose.

f. Joint Tape: Perf-A-Tape.

g. Wallboard Adhesive: Durabond 90 for double layer wallboard application.

h. Caulking Compound/ Acoustical Sealant: USG Acoustical Sealant.

i. USG Metal Z Furring Channel shall be of galvanized steel and of depth shown to allow thickness of rigid wall insulation or air space shown on Drawings.

j. No. 15 Asphalt Saturated Organic Felt: ASTM D 226 asphalt saturated organic fiber roofing felt, weighing approximately 13 lbs. per 100 sq. ft.

k. Resilient Channel: Type RC-1 by U.S. Gypsum Company or approved equal, of 25-gauge galvanized steel.

PART 3: EXECUTION

3.1 INSTALLATION GENERAL:

a. Follow manufacturer's printed instructions and recommendations of the USG's Gypsum Construction Handbook (latest edition).

3.2 INSTALLATION OF LIGHTWEIGHT FRAMING AND FURRING:

a. Follow manufacturer's printed instructions and recommendations of the USG's Gypsum Construction Handbook (latest edition). Observe details on Drawings. Framing shall be secure, rigid and with connections sufficiently strong to carry applied loads with a 2-to-1 safety factor.

b. Wall stud bridging shall be attached in a manner to prevent stud rotation. Bridging rows shall be spaced according to the following schedule. Walls up to 8'-0" height, one row at mid-height.

c. Work shall be plumb, level and true to line within a tolerance of plus or minus 1/8" in 10'-0" and with no abrupt deviations.

3.3 GENERAL REQUIREMENTS FOR INSTALLATION OF GYPSUM WALLBOARD:

a. Minimum temperature in space shall be 50 deg. F. and building shall be enclosed with all exterior doors and windows in place before beginning GWB work.

b. All ends and edges of all gypsum wallboard shall occur over supporting members. To minimize end joints, use wallboard of maximum practical lengths. Boards shall be brought into contact but shall not be forced into place. Where ends or edges abut they shall be neatly fitted.

c. End joints on vertical surfaces shall be staggered. Joints on opposite sides of partitions shall be arranged so as to occur on different studs. Joint layout at openings shall be made so that no end joints will align with edges of opening. Joints in multi-layer work shall be staggered so that joints in one layer will not occur over joints in second layer.

d. Apply metal trim at exposed edges of wallboard, at exposed external corners and edges abutting dissimilar materials.

f. Openings cut in wallboard to fit electrical outlets, plumbing, piping, etc., shall fit snugly and shall be small enough to be covered by standard size plates and escutcheons. Both face and back paper shall be cut for all cutouts which are not made by use of a saw.

g. Where wallboard is shown on the Drawings to be extended to building structure above, it shall follow the profile of the structure and the joints shall be bedded and taped. Sanding of joints above ceiling is not required.

3.4 FURRING CHANNELS:

a. Screw clip hat-shaped channel furring to supports. Space furring channels at 1'-4" o.c. unless shown otherwise on the Drawings. Overlap splices of furring channels 5 1/2". Secure with 2 double strand ties. Minimum end clearances at walls for furring channels shall be 3/8".

3.5 APPLICATION OF WALLBOARD ON FURRING CHANNELS:

a. Attach wallboard with long dimension at right angles to main furring channels. Secure wallboard to furring channels with screws at 8" at perimeters and 12" in the field of the panels.

b. All screws shall be power-driven with an electric screwdriver. Screw heads shall provide a slight depression below surface of board without cutting paper.

3.6 APPLICATION OF WALLBOARD ON STEEL STUDS:

a. Provide single-layer vertical application of gypsum panels and space screws 12" o.c. in field of panels and 8" o.c. staggered along vertical abutting edges.

b. For double-layer laminated construction, attach base layer with 1" Type S screws spaced 8" o.c. at joint edges and 12" o.c. in field. Apply face layer vertically with adhesive on back side, joints staggered approximately 12" and fastened to base layer with 1 1/2" Type G screws. Drive screws approximately 2' from ends and 4' o.c. in field of panel, 1' from ends and 3' o.c. along a line 2" from vertical edges. Temporary shoring or support installed 16" to 24" o.c. until adhesive is dry may be used in place of screws.

1. In lieu of using adhesive, both layers may be screw attached as follows: attach the base layer with screws at 12" o.c. both at the perimeter and field of the panel and then attach the face layer with screws 12" o.c. both at the perimeter and field of the panel.

3.7 APPLICATION OF RIGID INSULATION AND WALLBOARD ON STEEL STUDS:

a. Attach rigid insulation board horizontally to steel studs (or furring channels) using 3/8" continuous adhesive beads applied to face of studs. Apply one bead to intermediate studs and two beads to studs occurring at insulation joints. Impact insulation along each stud to insure good contact at all joints.

b. Attach wallboard vertically to installed insulation and studs with screws through insulation and stud flange 12" o.c. in field of wallboard and track runners and 8" o.c. staggered along vertical abutting edges.

3.8 FINISHING:

a. Joint Treatment: Embed tape in cementing compound. Cover with 3 applications of fill coat in accordance with the Gypsum Association Level 4 Gypsum Board Finish Requirements.

(use Level 5 under critical lighting conditions or when glossy paint is used) Install materials in accordance with manufacturer's printed instructions to produce smooth, inconspicuous joints and well filled to prevent ridging. Avoid raising nap on wallboard when sanding down fill coats.

b. Wallboard Face Repair: Repair and finish all attachment heads, depressions and minor wallboard face imperfections with material and as recommended by the manufacturer.

3.9 CONTROL JOINTS:

a. Provide control joints at locations shown on the Drawings and if not shown at maximum spacing given in table titled "Max. Spacing USG Control Joints" included in the U. S. Gypsum Construction Handbook, latest edition.

3.10 NO. 15 FELT: Install on gypsum sheathing at locations shown on the Drawings. Lap joints not less than 2". Install to provide a continuous water barrier to protect the gypsum sheathing. Where gypsum sheathing abuts water impermeable materials such as concrete, masonry or steel, Contractor will have the option of continuing the felt across these materials or terminating the felt at these materials with a watertight joint such as termination bar and sealant. Where gypsum sheathing abuts water permeable materials such as plywood, etc., the felt is to be continued across these materials.

3.11 LOCATIONS: Unless shown otherwise on the Drawings, use the specified materials in the following general locations:

a. Standard Wallboard: At locations not specified otherwise.

b. Gypsum Wallboard with Vapor Barrier: All exterior walls.

c. Gypsum Sheathing: On exterior side of studs in exterior walls.

END OF SECTION

SECTION 09 91 00
FIELD PAINTING

PART 1: GENERAL

1.1 RELATED DOCUMENTS:

a. Drawings and general provisions of Contract, including General and Supplementary General Conditions and Division 1 Specification Sections, apply to work of this Section.

1.2 SCOPE:

a. Related Work Specified Elsewhere:

1. Shop priming and factory finishing of certain materials and equipment are specified in other sections of the Specifications.

b. Work Included This Section:

1. All field painting on the entire Project, including new and existing materials and equipment specified in other Sections and plumbing, mechanical and electrical materials and equipment specified in Divisions 22, 23 and 26, is specified as work of this Section 09 91 00, with the following exception:

(a) Painting of plumbing, mechanical and electrical materials and equipment located inside Equipment Rooms is specified in Divisions 22, 23 and 26 to be provided by the plumbing, mechanical and electrical trades.

2. Paint all surfaces exposed to view in the completed work, both exterior and interior, unless specifically enumerated not to be painted.

3. Work includes field painting of exposed bare and covered pipes, conduit and ducts (including color coding), and of hangers, exposed steel conduit and iron work, miscellaneous metal items and primed metal surfaces of materials and equipment installed under plumbing, mechanical and electrical work.

4. Work includes stenciling "Fire And Smoke Barrier - Protect All Openings", or similar wording as required by authorities having jurisdiction, signs above ceilings on both sides of all fire rated walls.

5. Except where natural finish of material is specifically noted as a surface not to be painted, paint exposed surfaces whether or not designated in finish schedules. Where items or surfaces are not specifically mentioned, paint the same as similar adjacent materials or areas. If color or finish is not designated, Architect will select these from standard colors or finishes available.

6. "Paint" as used herein means all coating systems materials, including primers, emulsions, enamels, stains, sealers and fillers, and other applied materials whether used as prime, intermediate or finish coats.

7. Surface preparation, priming and coats of paint specified are in addition to shop-priming and surface treatment specified under other sections of work.

c. Surfaces Not to Be Painted:

1. Unless otherwise indicated, painting is not required for surfaces for which the natural finish of the material is obviously the final finish, such as (for example only) glass and other such items that traditionally and obviously are not painted.

2. Pre-Finished Items: Unless otherwise indicated, do not include painting when factory-finishing or installer-finishing is specified for such items as (for example only) acoustic materials and pre-finished mechanical and electrical equipment, including light fixtures, switchgear and distribution cabinets.

3. Concealed Surfaces: Unless otherwise indicated, painting is not required on surfaces such as (for example only) walls or ceilings in concealed areas and generally inaccessible areas, furred areas, pipe spaces, and duct shafts.

4. Finished Metal Surfaces: Unless otherwise indicated, metal surfaces of (for example only) anodized aluminum, stainless steel, chromium plate, and similar finished materials will not require finish painting. Note that galvanized steel does not fall into this category and is required to be painted.

5. Operating Parts: Unless otherwise indicated, moving parts of operating units, mechanical and electrical parts, such as valve and damper operators, linkages, sinkages, sensing devices, motor and fan shafts will not require finish painting.

6. Do not paint over any code-required labels, such as Underwriters' Laboratories and Factory Mutual, or any equipment identification, performance rating, name, or nomenclature plates. An exception to this is that embossed or etched fire rating labels on hollow metal frames may be painted over provided that they are cleaned and properly prepared so that paint will adhere tightly to the label.

1.3 QUALITY CONTROL:

a. Color Samples: Submit samples of colors selected by the Architect in duplicate for final approval. Samples shall be approximately 8" x 10" size and on gypsum wallboard when finish is to be on gypsum wallboard or masonry; and on sheet steel when finish is to be on metal. Sample shall be finished as specified in "Schedule of Paint Systems."

b. Shop Drawings: Submit manufacturer's literature completely describing each type of paint, and including manufacturer's published installation instructions for each product. See Paragraph "Materials" for other submittal requirements.

c. Manufacturer’s Approval: Submit letter from manufacturer’s representative that substrates have been tested and moisture content in substrate is acceptable to receive paint system.

1.4 INDUSTRY STANDARDS:

a. Some products and execution are specified in this Section by reference to published specifications or standards of the following (with respective abbreviations used). Reference is to the latest edition of the standard referenced.

The American Society for Testing and Materials (ASTM)

1.5 PRODUCT HANDLING:

a. Delivery and Storage:

1. All materials shall be delivered to the site in the manufacturer's sealed packages with labels intact and seals unbroken.

2. A space will be designated for the storage of paint materials and tools. Whenever it may be necessary to change the location of this storage space, promptly move to the newly designated place. Protect the storage space floor from damage.

3. Cover all paints at all times. Take all safeguards to prevent fire.

PART 2: PRODUCTS

2.1 MATERIALS:

a. Painting Materials:

1. In order to describe type and quality of materials intended, painting materials specified are products of Sherwin Williams. Paint products of Benjamin Moore, PPG, Pratt and Lambert, or others may be used when the following is approved in writing by the Architect.

(a) Submit to the Architect a schedule of painting based on the format hereinafter used to specify paint systems for the various surfaces, stating the brand name, trade name and manufacturer's number of each of the materials proposed.

(b) Include manufacturer's data sheet for each type of paint proposed.

(c) Include complete installation instructions for each paint product including for stain and varnish work wood filler, solvent wash, stain, sanding sealer, varnish and all other products of the stain and varnish system.

(d) Receive from the Architect written approval of these submittals before beginning work.

2. Tinting of colorants shall be as recommended by manufacturer of finishing materials and shall be those supplied by the finish manufacturer. All colors shall be non-fading under exposure to which they will be normally subjected.

3. Additives to Finishing Materials: Add only those ingredients required or recommended by the manufacturer of the finishing material. Source of such additives shall be as recommended by the manufacturer of finishing material.

4. Thinner: Shall be type and product recommended by manufacturer of finishing material.

(a) Turpentine: Pure gum spirits of turpentine, conforming to ASTM D 13.

b. Metal Cleaners: As recommended by the paint manufacturer.

2.2 FIRE AND SMOKE BARRIER SIGNS:

a. Fire-rated walls shall be effectively and permanently identified with stenciled signs provided in accordance with the 2002 International Building Code with North Carolina Amendments and other authorities having jurisdiction. Such signs shall be located above any decorative ceiling and in concealed spaces, on both sides of the wall and shall read "Fire and Smoke Barrier - Protect All Openings". or similar wording as required by authorities having jurisdiction. Color shall be white background with red letters.

b. Stenciled letters shall be 2" high and signs shall be located 20'-0" on centers maximum.

2.3 SCHEDULE OF PAINT SYSTEMS:

a. Except as required otherwise in the Contract Documents for specific areas or surfaces, the following materials, or approved equal, shall be used on the surfaces scheduled:

b. Review the entire Drawings and Specifications including Divisions 15 and 16 Mechanical and Electrical Specifications for description of materials and equipment therein to be painted

under this Section. See Paragraph "1.2 Scope" for additional information and requirements regarding work included in this Section.

1. EXTERIOR PAINT SYSTEMS:

Provide the following paint systems for various substrates, as indicated:

(a) EXTERIOR FERROUS METAL:

SYSTEM	Latex Gloss
PRIMER	1 coat All Surface Enamel latex Primer A41W210
FINISH	2 coats A100 Exterior Latex Gloss House Paint

(b) EXTERIOR ALUMINUM:

SYSTEM	Gloss
FINISH	2 coats DTM Gloss (B66-100)

(c) EXTERIOR GALVANIZED METAL:

SYSTEM	Latex Gloss
PREP	SW Prepaint Cleaner (no rinse)
PRIMER	1 coat All Surface Enamel Latex
FINISH	2 coats A100 Latex Gloss House Paint

(d) EXTERIOR MASONRY:

SYSTEM	Latex Satin
PRIMER	1 coat All Surface Enamel Latex
FINISH	2 coats A100 Exterior Latex Satin

2. INTERIOR PAINT SYSTEMS: Provide the following paint systems for various substrates, as indicated:

(a) INTERIOR FERROUS METAL:

SYSTEM	Latex Semi Gloss
PRIMER	All Surface Latex Enamel Primer
FINISH	2 coats Pro Mar 200 Latex Semi-Gloss

(b) INTERIOR GALVANIZED METAL:

SYSTEM	Latex Semi Gloss
PRIMER	All Surface Latex Enamel Primer
FINISH	2 coats Pro Mar 200 Latex Semi-Gloss

(c) INTERIOR GYPSUM WALLBOARD: (Eggshell)

SYSTEM	Latex, Eggshell
PRIMER	1 coat Preprite Classic Primer
FINISH	2 coats Pro Mar Latex Eg-shel

(d) INTERIOR GYPSUM WALLBOARD (Flat)

SYSTEM	Latex Flat
PRIMER	1 coat Preprite Classic Primer
FINISH	2 coats Pro-Mar 200 Latex Flat

(e) PIPE AND EQUIPMENT INSULATED COVERING:

SYSTEM	Enamel, Semi Gloss
PRIMER	1 coat All Surface Enamel Primer A41W210
FINISH	2 coats Pro Mar 400 Latex Semi-Gloss

(f) PLASTIC SURFACES:

SYSTEM	Latex, Semi Gloss
PREPARATION	Scuff-sand all plastic surfaces prior to application of primer
PRIMER	1 coat Preprite Bonding Primer (test for adhesion)
FINISH	2 coats Pro Mar Latex Semi-Gloss

PART 3: EXECUTION

3.1 COLORS:

a. Before any work is done, the Architect will furnish the Contractor with a color schedule showing where the various colors shall go. The Contractor shall then submit samples and prepare samples at the job as specified in Paragraph "Submittals".

3.2 GENERAL REQUIREMENTS:

a. A pre-installation meeting is required for all painting. Meeting shall be attended by Owner, Architect, Contractor, and other representatives directly concerned with performance of the work. The Contractor will conduct the meeting.

b. All painting procedures, including surface preparation and application of materials shall be in strict accordance with the manufacturer's published instructions and recommendations.

c. The commencing of work, or the absence of notification in writing to the contrary, shall be construed as acceptance of the surfaces to be finished as satisfactory to receive the finishes and to produce the results required.

d. All spaces shall be broom clean before painting is started.

e. Surfaces to be finished shall be clean, dry, smooth and adequately protected from dampness.

f. Provide ample protection for, and take particular care to protect adjoining surfaces, fixtures and materials of all kinds. Repair any damage caused by the work of this Section. If necessary to accomplish this, remove and protect hardware, accessories, device plates, lighting fixtures, factory finished work and similar items. Upon completion of each space, carefully replace all removed items. Use only skilled mechanics for removal, replacement and protection.

g. Remove doors to finish top and bottom after doors have been fitted.

h. Remove electrical panel box cover and door before painting wall. Paint separately and reinstall after all paint is dry.

i. No work shall be done under conditions which are unsuitable for the production of good results. Do not apply paint when temperature is below 50^{o} F. Do not apply exterior paint in damp, rainy weather. Do not apply finishes on surfaces so hot as to prevent proper application and drying. Do not apply finishes in spaces where dust is being generated that would speck the finish.

j. Before painting masonry, test surfaces with a moisture testing device. No paint shall be applied on masonry when moisture is tested to be over 5.5%. Provide manufacturer's approval letter as specified in Part 1 of this Section.

3.3 PREPARATION OF SURFACES:

a. Existing Surfaces: All existing surfaces shall be prepped, as necessary, to receive the 3-coat paint system specified, including, but not limited to, removal of existing paint systems, patching, and sanding.

b. Masonry: Properly clean and prep to produce and satisfactory surface for painting.

c. Gypsum Drywall: Follow the USG Handbook (latest edition) for cleaning and prepping surface.

d. Plaster:

1. Fill holes and cracks. Seal before painting.

e. Steel and Iron:

1. Remove grease, rust, scale and dust. Except as noted otherwise, sandpaper as required to produce a satisfactory surface for painting.

f. Galvanized Metal: Thoroughly clean with metal cleaner according to cleaner manufacturer's directions; rinse and wipe dry. Galvanized steel manufacturer and paint manufacturer must approve the use of the cleaner prior to use.

3.4 PRIMING:

a. See the other Sections of these Specifications for shop priming requirements specifically related to materials and items therein specified.

b. The shop coat is not to be considered this Contractor's prime coat. Apply primer as specified.

c. All coats required in the schedule of painting shall be applied, including all scheduled prime coats and finish coats. Surfaces of factory primed items shall be sanded if necessary and otherwise properly prepared and all scheduled prime coats and finish coats shall be applied.

3.5 APPLICATION:

a. All paint materials shall be stirred or agitated thoroughly until the ingredients are completely mixed.

b. Surface to be painted shall be adequately protected from dampness.

c. Each coat of paint shall be well applied, worked out evenly and allowed to dry (at least 24 hours) before subsequent coat is applied.

d. Sand between coats to produce an even, smooth finish.

e. Suction or hot spots in masonry which are noticeable through the first coat shall be touched up before applying the second coat to produce an even result in the finish coat.

f. Where only one coat of the finish material is required by the schedule of painting, the undercoat shall be tinted to match the finish coat.

g. Finished work shall be uniform, of approved color, and free from runs, sags, defective brushing, clogging or excessive flooding. Make edges of paint adjoining other materials or colors sharp, straight, clean and without overlapping.

h. At completion, touch up and restore finish where damaged and leave in good condition.

i. Should any coat of paint be adjudged unsatisfactory by the Architect, it shall be sandpapered or removed and additional coats applied as necessary until satisfactory finish is achieved.

3.6 CLEANING:

a. All cloths and cotton waste that might constitute a fire hazard shall be placed in metal containers or destroyed at end of each working day.

b. At the completion of this work, all staging, scaffolding, containers, debris, etc., shall be removed from the premises.

c. Painted surfaces shall be left in a clean condition. Remove paint spots, oil or stains from adjacent surfaces.

d. Unstick all doors and repair any damaged areas of paint.

END OF SECTION

SECTION 13 12 00
PRE ENGINEERED STRUCTURES

RECOMMENDED REQUIREMENTS FOR ALUMINUM MEMBRANE STRUCTURES – FULLY ENCLOSED IN HIGH WIND & SNOW LOAD REGIONS

EXECUTIVE SUMMARY

SolidBox has developed a series of recommend requirements for fabric enclosed structures for regions that experience high combined wind and snow loads; wind speeds greater than 100 mph with ground snow loads greater than 10 psf. The recommendations presented herein are based on information collected throughout the analysis of multiple structures in these regions. This includes compliance with ASCE 7-16, data collected from field inspections, and engineering best-practices.

STRUCTURAL REQUIREMENTS

Compliance with ASCE 7-16:
Currently, many states within High Wind & Snow Load Regions only require compliance with the ASCE 7-10 code. However, SolidBox recommends that all vendors provide structural calculations that meet the ASCE 7-16 code (Minimum Design Loads and Associated Criteria for Buildings and Other Structures). The Basic Wind Speed maps have been updated in ASCE 7-16 to reflect the updated design wind speeds for these regions.

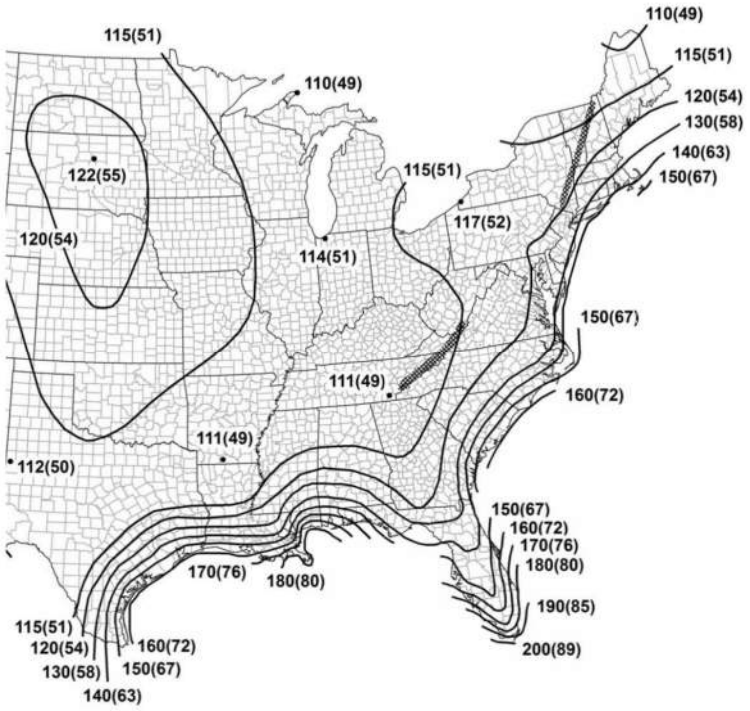

Figure 1: Basic Wind Speeds for Risk Category III Buildings and Other Structures (ASCE 7-16)

Risk Categorization:
SolidBox recommends that all vendors provide structural calculations that consider the fabric enclosed structure as a Risk Category III (Buildings and other structures, the failure of which could pose a substantial risk to human life) structure. Where the importance factors are listed as in Table 1.

Table 1: Importance Factors for Risk Category III

Risk Category	III
Importance Factors	
Snow (Is)	1.1
Wind (Iw)	1
Seismic (Ie)	1.25

Wind Pressure Calculations (CFD):
The ASCE 7-16 Code specifies wind pressure values for structures based on simplistic building profiles. While these ASCE values are often conservative for the purpose of structural validation, this approach often misses the negative effect created by adjacent topography, such as hills and adjacent structures. SolidBox recommends that all vendors provide structural calculations that calculate the realistic worst-case wind pressure scenarios based on all available information related to the building site.

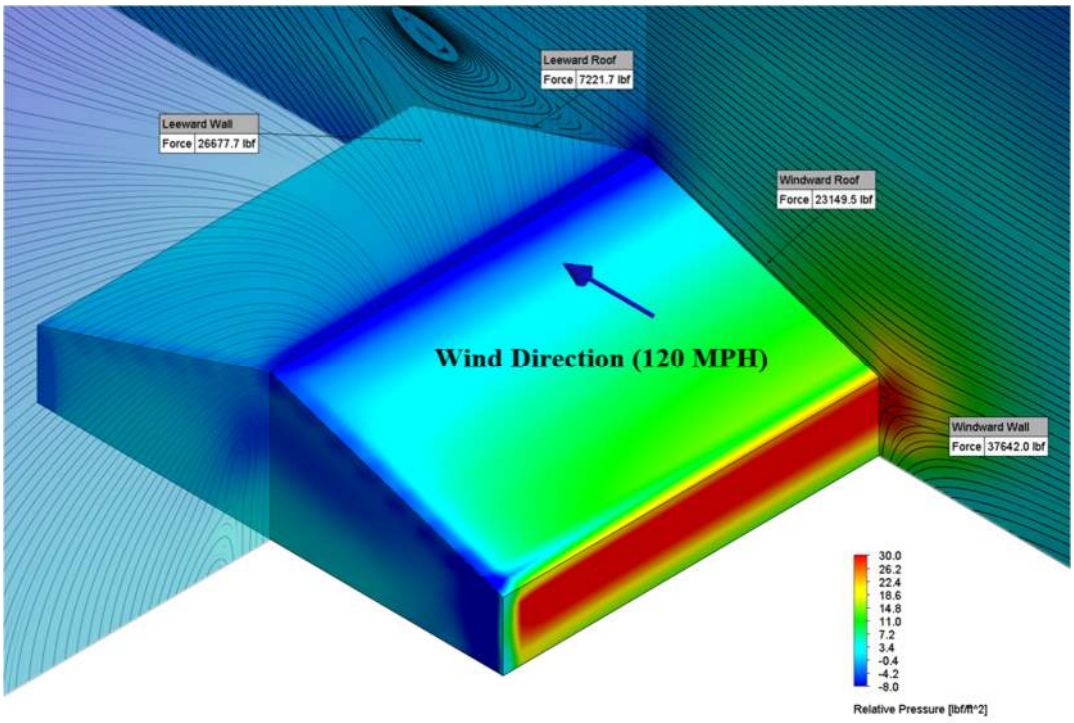

Figure 2: Computational Fluid Dynamic (CFD) Analysis of Fabric Structure

Structural Analysis Method (Allowable Stress Design):
SolidBox recommends that all vendors provide structural calculations that utilize the Allowable Stress Design method to validate the frame structure. Frame structures shall exceed the requirements of ASCE 7-16.

- FOS > 1.25, using Allowable Stress Design
  - Risk Category III
  - Design Wind Speed
  - Snow Load Capacity
  - Seismic Validation
- Wind Pressure Validated by Computational Fluid Dynamic (CFD) Software

- Effects of adjacent structures on Wind Pressure

Vendors shall validate structures for both Fully Enclosed & Partially Enclosed Fabric Configurations.
Factor of Safety (Aluminum Extrusions):
SolidBox recommends that all vendors utilize an additional Factor of Safety of 1.25 on the published allowable stress values for aluminum extrusions. The yield stress values are obtained from the manufacturers' material specification sheets and crosschecked against values established by the Aluminum Association 2020 edition of the Aluminum Design Manual.
Box Beam vs Truss Section Design:
SolidBox recommends that all vendors utilize a Truss Style design for structures that span more than 25m. Box Beam extrusions are less capable of buckling and torsional resistance when in excess of 12m section lengths, as compared to truss sections.

- Truss Structure for Spans > 25m
  - Box Beam not Recommended

Corrosion Resistance:

SolidBox recommends that all primary structural components be fabricated from corrosion resistant materials, i.e. Aluminum Alloys. The corrosive nature of swimming pools has a detrimental effect on any ferrous materials that can lead to premature failure of critical components.

- All Primary Structural Components shall be Aluminum Alloy
- Hardware shall be Stainless Steel
- Tension Cables shall be Galvanized

Operation, Maintenance, & Risk Mitigation Documentation:

Vendors shall supply post-installation operation and maintenance manuals that detail the proper maintenance protocols and inspection procedures for both the frame structure, tensioning hardware, and fabric panels.
Vendors shall supply a risk mitigation plan that details the process for reducing risk during severe weather events. Risk Mitigation plans shall document critical wind speed thresholds for the possible configurations of fabric panels on the structure. Risk Mitigation plans shall instruct personnel on proper removal of fabric panels during severe weather events.

SITE-SPECIFIC CONSTRUCTION DESIGN PARAMETERS

Truss Structure:

- Truss Structure shall be made of Aluminum Alloy for the top/bottom/inner cords with proper anodized coating to mitigate corrosion.
  - Aluminum Alloy Specification: 6005-T21
  - Anodizing Specification: R204-Clear
- Structural connections between leg to rafter shall be made of Aluminum Alloy with proper anodizing to mitigate galvanic corrosion.
  - Alloy Specification: 6061-T6
- Fasteners shall be made of 316 stainless-steel.
  - 304 SS only acceptable if 316 SS cannot be sourced for custom sizes.
  - Stainless Steel Specification: 304 or 316
- Vendor shall provide provisions for supporting wet sprinkler pipes.

Foundation:

- Foundation Design must comply with ASCE 7-16
- Truss Structure must be designed and engineered for attachment to the pool deck using (3) Three sides of the existing foundation (currently in place).
- Membrane structure supplier shall provide all necessary Stamped foundation drawings for construction of 4th foundation (required) for this project.

Fabric Design Parameters:

- Fabric Membrane shall be constructed from Serge-Ferrari 702-S2 Translucent material, or similar coated fabric with comparable tensile strength.
- Fabric Membrane shall be constructed using an acceptable air tensioning system on all roof fabric panels to ensure fabric is tensioned in all (4) four directions.
- Bids shall include ALL necessary components for operating the permanent air tension system for the roof panels.
    - All fittings, pumps, inflation lines, etc.
- Construction of Membrane Fabric shall have removable Side wall pieces while the Roof fabric remains installed (No one-piece fabric construction of the roof and walls will be accepted).

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SERGE FERRARI SAS
TEST REPORT

SCOPE OF WORK
NFPA 701-2019, METHOD 2 - STANDARD METHODS OF FIRE TESTS FOR FLAME PROPAGATION OF TEXTILES AND FILMS FOR FLAT SHEETS (SEE SECTION 13.1.3) ON 702/B702

REPORT NUMBER
105207650MID-001A

TEST DATE(S)
10/05/22

ISSUE DATE **[REVISED DATE]**
10/06/22 N/A

PAGES
5

DOCUMENT CONTROL NUMBER
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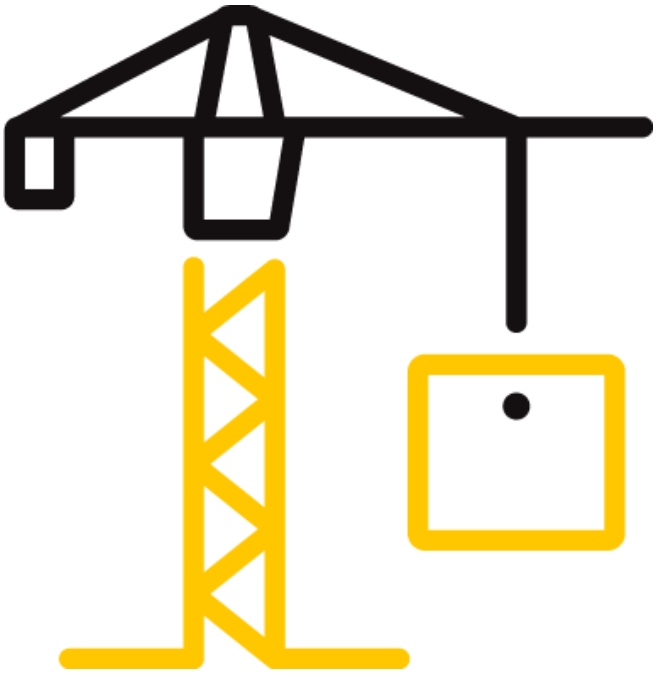

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TEST REPORT FOR SERGE FERRARI SAS
Report No.: 105207650MID-001A
Date: 10/06/22

REPORT ISSUED TO

SERGE FERRARI SAS
Zone Industrielle BP 54
38352 La Tour Du Pin Cedex
La Tour Du Pin, 38110
France

SECTION 1

SCOPE

Intertek Testing Services NA, Inc. dba Intertek Building & Construction (B&C) was contracted by Serge Ferrari SAS, Zone Industrielle BP 54, 38352 La Tour Du Pin Cedex, La Tour Du Pin, 38110, France to perform testing in accordance with NFPA 701-2019, Method 2 - *Standard Methods of Fire Tests for Flame Propagation of Textiles and Films for Flat Sheets* (See section 13.1.3), on their 702/B702. Results obtained are tested values and were secured by using the designated test method(s). Testing was conducted at Intertek test facility in Middleton, WI.

Unless differently required, Intertek reports apply the "Simple Acceptance" rule also called “Shared Risk approach,” of ILAC-G8:09/2019, Guidelines on Decision Rules and Statements of Conformity.

Intertek B&C will service this report for the entire test record retention period. The test record retention period ends four years after the test date. Test records, such as detailed drawings, datasheets, representative samples of test specimens (where required by Certification or Accreditation bodies), or other pertinent project documentation, will be retained for the entire test record retention period.

SECTION 2

SUMMARY OF TEST RESULTS

702/B702 met the specified performance requirements.

For INTERTEK B&C:

COMPLETED BY:	Joel Zumwalt	**REVIEWED BY:**	Sandy Osborne
TITLE:	Lab Technician III	**TITLE:**	Lab Technician I
SIGNATURE:		**SIGNATURE:**	
DATE:	10/06/22	**DATE:**	10/06/22

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TEST REPORT FOR SERGE FERRARI SAS
Report No.: 105207650MID-001A
Date: 10/06/22

SECTION 3
TEST METHOD(S)

The specimens were evaluated in accordance with the following:

NFPA 701-2019, *Standard Methods of Fire Tests for Flame Propagation of Textiles and Films*

SECTION 4
MATERIAL SOURCE/INSTALLATION

Test samples were provided by the client. The results outlined in this report apply to the sample as received. Samples were received at the Evaluation Center on October 3, 2022 in good condition verified by Sample ID# MID2210031411-001.

SECTION 5
EQUIPMENT

EQUIPMENT			
DESCRIPTION - ASSET #:	Stopwatch - 1404	**CALIBRATION DUE:**	4/5/2023
DESCRIPTION - ASSET #:	Oven - 1200	**CALIBRATION DUE:**	FRO
DESCRIPTION - ASSET #:	Scale - 1396	**CALIBRATION DUE:**	4/5/2023
DESCRIPTION - ASSET #:	Test Cabinet - 1203	**CALIBRATION DUE:**	FRO
DESCRIPTION - ASSET #:	Flowmeter - 1209	**CALIBRATION DUE:**	8/5/2023
DESCRIPTION - ASSET #:	Burner- 1473	**VBU:**	10/5/2022
DESCRIPTION - ASSET #:	Oven Logger - 701	**CALIBRATION DUE:**	1/6/2023
DESCRIPTION - ASSET #:	Temp/Humid Reader - 1562	**CALIBRATION DUE:**	2/2/2023
DESCRIPTION - ASSET #:	Temp/Humid Reader Sample Rm- 1451	**CALIBRATION DUE:**	3/21/2023

SECTION 6
TEST PROCEDURE

Testing was conducted in accordance with Chapter 14; Flame Test Procedures for Test Method 2. There were no deviations to the standard.

SECTION 7
TEST CRITERIA

TEST CRITERIA
1. No specimen shall continue flaming for more than two sec.
2. Length of char shall not exceed 17.1 in from the bottom edge of the specimen.
3. No flaming on the floor of apparatus is allowed for longer than 2 sec.

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TEST REPORT FOR SERGE FERRARI SAS
Report No.: 105207650MID-001A
Date: 10/06/22

SECTION 8
TEST SPECIMEN DESCRIPTION

Samples were received as a large roll white in color consisting of Polyester yarns (1100 dtex) coated with PVC flame retardant on both sides and varnished. Weight: 750 g/m²+-5% Thickness: 0.57 mm+-10% Polyester yarn 1100 dtex: 24% - PVC flame retardant: 76%. It was then cut to ten approximately 47" by 5" panels. The panels were subjected to conditioning for at least 60 minutes at 105°C ± 3°C and not more than 180 minutes by Intertek prior to testing.

SECTION 9
TEST RESULTS

TEST RESULTS			
Specimen	After Flame	Floor Flaming (sec)	Char Length (in)
1	0	0	7.19
2	0	0	6.25
3	0	0	7.00
4	0	0	6.25
5	0	0	7.75
6	0	0	6.31
7	0	0	6.00
8	0	0	7.25
9	0	0	7.50
10	0	0	6.75
Average	0	0	6.83

OBSERVATIONS
Specimens ignited upon introduction to test flame producing light grey smoke. Specimens self-extinguished prior to removal of test flame.
Specimens exhibited no flaming dripping.

SPECIMEN DENSITY			
	Specimen 1	Specimen 2	Specimen 3
Weight (g)	7.53	7.55	7.6
Length (mm)	101	100	101
Width (mm)	100	101	101
g/m^2	745.54	747.52	745.02
		Average	746.03

SECTION 10
CONCLUSION

No specimen continued flaming for more than two seconds. The length of char did not exceed 17.1 inches from the bottom edge of the specimen for flat sheets (see section 13.1.3). No flaming on floor of apparatus lasted longer than two seconds.

702/B702 met the specified performance requirements.

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SECTION 11
REVISION LOG

REVISION #	DATE	SECTION	REVISION
0	10/06/22	N/A	Original Report Issue

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SERGE FERRARI
FIRE TEST REPORT

SCOPE OF WORK
ASTM E84 TESTING ON 702 OPAQUE

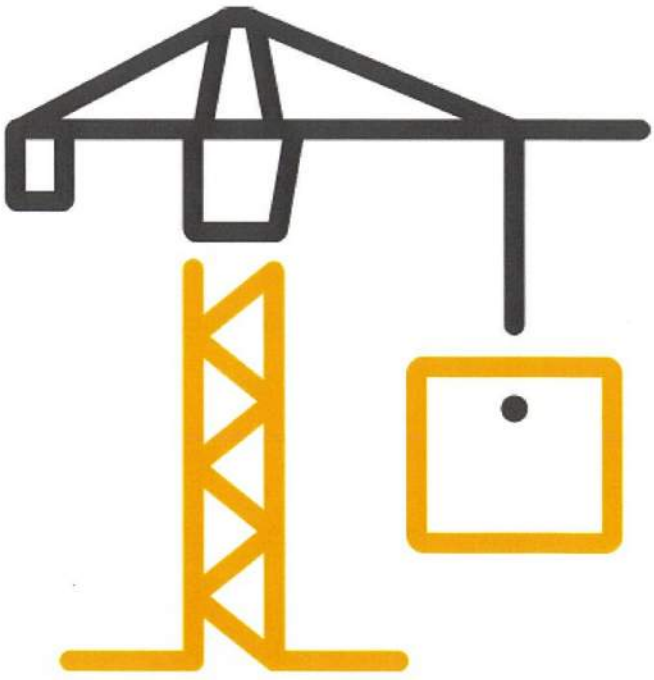
REPORT NUMBER
104580419SAT-001

TEST DATE
1/28/21

ISSUE DATE
1/29/21

PAGES
11

DOCUMENT CONTROL NUMBER
RT-R-AMER-Test-2780 (9/19/18)



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TEST REPORT FOR SERGE FERRARI
Report No.: 104580419SAT-001
Date: 1/29/21

REPORT ISSUED TO
Serge Ferrari
Zone Industrielle BP 54
38352 La Tour Du Pin Cedex
France

SECTION 1
SCOPE

Intertek Building & Construction (B&C) was contracted by Serge Ferrari, Zone Industrielle BP 54, 38352 La Tour Du Pin Cedex, France, to evaluate the flame spread and smoke developed properties of 702 Opaque. Testing was conducted at the Intertek B&C test facility in Elmendorf, Texas. Results obtained are tested values and were secured by using the designated test method(s). A summary of test results and the complete graphical test data is reported herein.

This report does not constitute performance certification of this product nor an opinion or endorsement by this laboratory. Intertek B&C will service this report for the entire test record retention period. The test record retention period ends four years after the test date. Test records, such as detailed drawings, datasheets, representative samples of test specimens, or other pertinent project documentation, will be retained for the entire test record retention period.

SECTION 2
SUMMARY OF TEST RESULTS

Specimen I.D.: 702 Opaque

ASTM E84 Test Results

FLAME SPREAD INDEX	SMOKE DEVELOPED INDEX
10	350

*See Section 8 for additional information and commentary

For INTERTEK B&C:

COMPLETED BY:	Joseph Martinez	REVIEWED BY:	Servando Romo
TITLE:	Technician	TITLE:	Project Engineer
SIGNATURE:		SIGNATURE:	
DATE:	1/29/21	DATE:	1/29/21