architectural design studio

PROJECT MANUAL
FOR:

Division 14
Swain County Storage Shed

NC DEPARTMENT OF TRANSPORTATION
Swain County, North Carolina

SCO ID# 14-11264-01A

November 1, 2018

Architectural Design Studio, P.A.
70 Wall Street
Asheville NC 28801
P: 828.252.0355
ads-architects.com

SECTION 00 0101
PROJECT TITLE PAGE

PROJECT MANUAL
for
DIVISION 14 SWAIN COUNTY STORAGE SHED
NC Department of Transportation
Swain County, North Carolina

SCO ID# 14-11264-01A

OWNER
State of North Carolina through
North Carolina Department of Transportation
Sterling Baker, P.E
Director, Facilities Management Unit
1525 Mail Service Center
Raleigh, North Carolina 27699-1525

ARCHITECT
Architectural Design Studio, P.A.
70 Wall Street
Asheville, North Carolina, 28801

STRUCTURAL ENGINEER
SKA Consulting Engineers, Inc.
64 Peachtree Road, Suite 30
Asheville, North Carolina, 28803

PLUMBING, MECHANICAL, ELECTRICAL ENGINEERS
McKim & Creed, Inc.
370 N. Louisiana Ave.
Asheville, North Carolina, 28806

November 1, 2018

END OF PROJECT TITLE PAGE

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REQUIRED FORMS

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ADVERTISEMENT FOR BIDS

Sealed proposals will be received until 3:00 p.m. on January 23, 2019, by Mr. Owen Daniels, Project Manager, NCDOT, Facilities Management Unit, in the Highway Division 14 Main Office Building, 253 Webster Road, Sylva, North Carolina 28779, for the construction of the Division 14 Swain County Storage Shed, SCO# 14-11264-01A, at which time and place bids will be opened and read.

An open pre-bid conference will be held on January 10, 2019 at 11:00 a.m. at the Office Building at the NCDOT Maintenance Yard, 345 Toot Hollow Road, Bryson City, North Carolina 28713.

Complete plans and specifications for this project can be obtained or reviewed during normal office hours after December 6, 2018 in the offices of Architectural Design Studio, P.A., 70 Wall Street, Asheville, North Carolina 28801, 828-252-0355. Digital Plans will be sent to the following plan rooms: the Builders Exchange of Tennessee, Dodge Data & Analytics, ConstructConnect, the Hispanic Contractors Association of the Carolinas and the Women's Business Center of Charlotte. Digital plans and specifications may be downloaded at the NCDOT website at the following link:

https://connect.ncdot.gov/letting/Pages/Letting-List.aspx?let_type=13&let_status=Advertised

Hard Copy Plan Deposit - $100.00

The state reserves the unqualified right to reject any and all proposals.

Signed:

Sterling Baker, P.E.
Director, Facilities Management Unit
NC Department of Transportation
1525 Mail Services Center
Raleigh, North Carolina 27699-1525

N O T I C E TO B I D D E R S

Sealed proposals will be received by the NC Department of Transportation in Sylva, NC, by Mr. Owen Daniels, Project Manager, Facilities Management Unit, in the Highway Division 14 Main Office Building at the 253 Webster Road Road, Sylva, North Carolina 28779 up to 3:00 pm on January 23, 2019 and immediately thereafter publicly opened and read for the furnishing of labor, material and equipment entering into the construction of

Division 14 Swain County Storage Shed

The work includes, but is not limited to, demolition of existing storage building and erection of a new storage building. Trades include cast-in-place concrete, concrete and brick unit masonry, steel joist framing and decking, metal roof and wall panels, gutters and downspouts, hollow metal doors and frames, overhead sectional doors, gypsum board assemblies, painting, protective covers, plumbing fixtures and piping, mechanical systems, electrical power and lighting.

Bids will be received *for* Single Prime Contracts. All proposals shall be lump sum.

Pre-Bid Meeting

An open pre-bid meeting will be held for all interested bidders on January 10, 2019 at 11:00 am at the Office Building at the NCDOT Maintenance Yard, 345 Toot Hollow Road, Bryson City, North Carolina 28713. The meeting will address project specific questions, issues, bidding procedures and bid forms.

Complete plans, specifications and contract documents will be open for inspection in the offices of the Highway Division 14 Main Office Building at the 253 Webster Road Road, Sylva, North Carolina 28779, and in the offices of Architectural Design Studio, P.A., 70 Wall Street in Asheville, North Carolina 28801. Digital plans and specifications will be provided to the plan rooms of the Builders Exchange of Tennessee, Dodge Data & Analytics, ConstructConnect, the Hispanic Contractors Association of the Carolinas and the Women's Business Center of Charlotte. Hard copies of plan sets may be obtained from Architectural Design Studio, 828-252-0355, upon deposit of one hundred dollars ($100.00 by certified check). The full plan deposit will be returned provided all documents are returned in good, usable condition within ten (10) days after the bid date. Digital plans and specifications may be downloaded free of charge at the NCDOT website at the following link:
https://connect.ncdot.gov/letting/Pages/Letting-List.aspx?let_type=13&let_status=Advertised

NOTE: The bidder shall include with the bid proposal the form *Identification of Minority Business Participation* identifying the minority business participation it will use on the project and shall include either *Affidavit **A*** or *Affidavit **B*** as applicable. Forms and instructions are included within the Proposal Form in the bid documents. Failure to complete these forms is grounds for rejection of the bid. (GS143-128.2c Effective 1/1/2002.)

All contractors are hereby notified that they must have proper license as required under the state laws governing their respective trades.

General contractors are notified that Chapter 87, Article 1, General Statutes of North Carolina, will be observed in receiving and awarding general contracts. General contractors submitting bids on this project must have license classification for **Building**.

Each proposal shall be accompanied by a cash deposit or a certified check drawn on some bank or trust company, insured by the Federal Deposit Insurance Corporation, of an amount

equal to not less than five percent (5%) of the proposal, or in lieu thereof a bidder may offer a bid bond of five percent (5%) of the bid executed by a surety company licensed under the laws of North Carolina to execute the contract in accordance with the bid bond. Said bid bond shall be executed on the State Form of Bid Bond included in the specification manual. Said deposit shall be retained by the owner as liquidated damages in event of failure of the successful bidder to execute the contract within ten days after the award or to give satisfactory surety as required by law.

A performance bond and a payment bond executed on the State forms included in the specification manual will be required for one hundred percent (100%) of the contract price.

Payment will be made based on ninety-five percent (95%) of monthly estimates and final payment made upon completion and acceptance of work.

No bid may be withdrawn after the scheduled closing time for the receipt of bids for a period of 30 days.

The owner reserves the right to reject any or all bids and to waive informalities.

Designer:

Architectural Design Studio, PA
70 Wall Street
Asheville NC 28801
Phone 828-252-0355

Owner:

State of North Carolina through
NC Department of Transportation
by Sterling Baker, P.E.
Director, Facilities Management Unit
1525 Mail Service Center
Raleigh, NC 27699-1525

INSTRUCTIONS TO BIDDERS

AND

GENERAL CONDITIONS OF THE CONTRACT

STANDARD FORM FOR CONSTRUCTION PROJECTS

STATE CONSTRUCTION OFFICE

NORTH CAROLINA

DEPARTMENT OF ADMINISTRATION

Form OC-15

This document is intended for use on State capital construction projects and shall not be used on any project that is not reviewed and approved by the State Construction Office. Extensive modification to the General Conditions by means of "Supplementary General Conditions" is strongly discouraged. State agencies and institutions may include special requirements in "Division 1 – General Requirements" of the specifications, where they do not conflict with the General Conditions.

Twenty Fourth Edition January 2013

INSTRUCTIONS TO BIDDERS

For a proposal to be considered it must be in accordance with the following instructions:

1. **PROPOSALS**

Proposals must be made in strict accordance with the Form of Proposal provided therefor, and all blank spaces for bids, alternates, and unit prices applicable to bidder's work shall be properly filled in. When requested alternates are not bid, the proposer shall so indicate by the words "No Bid". Any blanks shall also be interpreted as "No Bid".The bidder agrees that bid on Form of Proposal detached from specifications will be considered and will have the same force and effect as if attached thereto. Photocopied or faxed proposals will not be considered. Numbers shall be stated both in writing and in figures for the base bids and alternates. If figures and writing differ, the written number will supersede the figures.

Any modifications to the Form of Proposal (including alternates and/or unit prices) will disqualify the bid and may cause the bid to be rejected.

The bidder shall fill in the Form of Proposal as follows:

a. If the documents are executed by a sole owner, that fact shall be evidenced by the word "Owner" appearing after the name of the person executing them.

b. If the documents are executed by a partnership, that fact shall be evidenced by the word "Co-Partner" appearing after the name of the partner executing them.

c. If the documents are executed on the part of a corporation, they shall be executed by either the president or the vice president and attested by the secretary or assistant secretary in either case, and the title of the office of such persons shall appear after their signatures. The seal of the corporation shall be impressed on each signature page of the documents.

d. If the proposal is made by a joint venture, it shall be executed by each member of the joint venture in the above form for sole owner, partnership or corporation, whichever form is applicable.

e. All signatures shall be properly witnessed.

f. If the contractor's license of a bidder is held by a person other than an owner, partner or officer of a firm, then the licensee shall also sign and be a party to the proposal. The title "Licensee" shall appear under his/her signature.

Proposals should be addressed as indicated in the Advertisement for Bids and be delivered, enclosed in an opaque sealed envelope, marked "Proposal" and bearing the title of the work, name of the bidder, and the contractor's license number of the bidder. Bidders should clearly mark on the outside of the bid envelope which contract(s) they are bidding.

Bidder shall identify on the bid**,** the minority businesses that will be utilized on the project with corresponding total dollar value of the bid and affidavit listing good faith efforts or an affidavit indicating work under contract will be self-performed, as required by G.S. 143-128.2(c) and G.S. 143-128.2(f). Failure to comply with these requirements is grounds for rejection of the bid.

For projects bid in the single-prime alternative, the names and license numbers of major subcontractors shall be listed on the proposal form.

It shall be the specific responsibility of the bidder to deliver his bid to the proper official at the selected place and prior to the announced time for the opening of bids. Later delivery of a bid for any reason, including delivery by any delivery service, shall disqualify the bid.

Unit prices quoted in the proposal shall include overhead and profit and shall be the full compensation for the contractor's cost involved in the work. See General Conditions, Article 19c-1.

2. EXAMINATION OF CONDITIONS

It is understood and mutually agreed that by submitting a bid the bidder acknowledges that he has carefully examined all documents pertaining to the work, the location, accessibility and general character of the site of the work and all existing buildings and structures within and adjacent to the site, and has satisfied himself as to the nature of the work, the condition of existing buildings and structures, the conformation of the ground, the character, quality and quantity of the material to be encountered, the character of the equipment, machinery, plant and any other facilities needed preliminary to and during prosecution of the work, the general and local conditions, the construction hazards, and all other matters, including, but not limited to, the labor situation which can in any way affect the work under the contract, and including all safety measures required by the Occupational Safety and Health Act of 1970 and all rules and regulations issued pursuant thereto. It is further mutually agreed that by submitting a proposal the bidder acknowledges that he has satisfied himself as to the feasibility and meaning of the plans, drawings, specifications and other contract documents for the construction of the work and that he accepts all the terms, conditions and stipulations contained therein; and that he is prepared to work in cooperation with other contractors performing work on the site.

Reference is made to contract documents for the identification of those surveys and investigation reports of subsurface or latent physical conditions at the site or otherwise affecting performance of the work which have been relied upon by the designer in preparing the documents. The owner will make copies of all such surveys and reports available to the bidder upon request.

Each bidder may, at his own expense, make such additional surveys and investigations as he may deem necessary to determine his bid price for the performance of the work. Any on-site investigation shall be done at the convenience of the owner. Any reasonable request for access to the site will be honored by the owner.

3. BULLETINS AND ADDENDA

Any addenda to specifications issued during the time of bidding are to be considered covered in the proposal and in closing a contract they will become a part thereof. It shall be the bidder’s responsibility to ascertain prior to bid time the addenda issued and to see that his bid includes any changes thereby required.

Should the bidder find discrepancies in, or omission from, the drawings or documents or should he be in doubt as to their meaning, he shall at once notify the designer who will send written instructions in the form of addenda to all bidders. Notification should be no later than seven (7) days prior to the date set for receipt of bids. Neither the owner nor the designer will be responsible for any oral instructions.

All addenda should be acknowledged by the bidder(s) on the Form of Proposal. However, even if not acknowledged, by submitting a bid, the bidder has certified that he has reviewed all issued addenda and has included all costs associated within his bid.

4. BID SECURITY

Each proposal shall be accompanied by a cash deposit or a certified check drawn on some bank or trust company insured by the Federal Deposit Insurance Corporation, or a bid bond in an amount equal to not less than five percent (5%) of the proposal, said deposit to be retained by the owner as liquidated damages in event of failure of the successful bidder to execute the contract within ten (10) days after the award or to give satisfactory surety as required by law (G.S. 143-129).

Bid bond shall be conditioned that the surety will, upon demand, forthwith make payment to the obligee upon said bond if the bidder fails to execute the contract. The owner may retain bid securities of any bidder(s) who may have a reasonable chance of award of contract for the full duration of time stated in the Notice to Bidders. Other bid securities may be released sooner, at the discretion of the owner. All bid securities (cash or certified checks) shall be returned to the bidders promptly after award of contracts, and no later then seven (7) days after expiration of the holding period stated in the Notice to Bidders. Standard Form of Bid Bond is included in these specifications and shall be used.

5. RECEIPT OF BIDS

Bids shall be received in strict accordance with requirements of the General Statutes of North Carolina. Bid security shall be required as prescribed by statute. Prior to the closing of the bid, the bidder will be permitted to change or withdraw his bid. Guidelines for opening of public construction bids are available from the State Construction Office.

6. OPENING OF BIDS

Upon opening, all bids shall be read aloud. Once bidding is closed, there shall not be any withdrawal of bids by any bidder and no bids may be returned by the designer to any bidder. After the opening of bids, no bid may be withdrawn, except under the provisions of General Statute 143-129.1, for a period of thirty days unless otherwise specified. Should the successful bidder default and fail to execute a contract, the contract may be awarded to the next lowest and responsible bidder. The owner reserves the unqualified right to reject any and all bids. Reasons for rejection may include, but shall not be limited to, the following:

a. If the Form of Proposal furnished to the bidder is not used or is altered.

b. If the bidder fails to insert a price for all bid items, alternate and unit prices requested.

c. If the bidder adds any provisions reserving the right to accept or reject any award.

d. If there are unauthorized additions or conditional bids, or irregularities of any kind which tend to make the proposal incomplete, indefinite or ambiguous as to its meaning.

e. If the bidder fails to complete the proposal form where information is requested so the bid may be properly evaluated by the owner.

f. If the unit prices contained in the bid schedule are unacceptable to the owner and the State Construction Office.

g. If the bidder fails to comply with other instructions stated herein.

7. BID EVALUATION

The award of the contract will be made to the lowest responsible bidder as soon as practical. The owner may award on the basis of the base bid and any alternates the owner chooses.

Before awarding a contract, the owner may require the apparent low bidder to qualify himself to be a responsible bidder by furnishing any or all of the following data:

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

b. A listing of completed projects of similar size.

c. Permanent name and address of place of business.

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

e. The name and home office address of the surety proposed and the name and address of the responsible local claim agent.

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

g. If prequalified, contractor info will be reviewed and evaluated comparatively to submitted prequalification package.

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

In determining the lowest responsible, responsive bidder, the owner shall take into consideration the bidder's compliance with the requirements of G.S. 143-128.2(c), the past performance of the bidder on construction contracts for the State with particular concern given to completion times, quality of work, cooperation with other contractors, and cooperation with the designer and owner. Failure of the low bidder to furnish affidavit and/or documentation as required by G.S. 143-128.2(c) shall constitute a basis for disqualification of the bid.

Should the owner adjudge that the apparent low bidder is not the lowest responsible, responsive bidder by virtue of the above information, said apparent low bidder will be so notified and his bid security shall be returned to him.

8. PERFORMANCE BOND

The successful bidder, upon award of contract, shall furnish a performance bond in an amount equal to 100 percent of the contract price. See Article 35, General Conditions.

9. PAYMENT BOND

The successful bidder, upon award of contract, shall furnish a payment bond in an amount equal to 100 percent of the contract price. See Article 35, General Conditions.

10. PAYMENTS

Payments to the successful bidders (contractors) will be made on the basis of monthly estimates. See Article 31, General Conditions.

11. PRE-BID CONFERENCE

Prior to the date set for receiving bids, the Designer may arrange and conduct a Pre-Bid Conference for all prospective bidders. The purpose of this conference is to review project requirements and to respond to questions from prospective bidders and their subcontractors or material suppliers related to the intent of bid documents. Attendance by prospective bidders shall be as required by the "Notice to Bidders".

12. SUBSTITUTIONS

In accordance with the provisions of G.S. 133-3, material, product, or equipment substitutions proposed by the bidders to those specified herein can only be considered during the bidding phase until ten (10) days prior to the receipt of bids when submitted to the Designer with sufficient data to confirm material, product, or equipment equality. Proposed substitutions submitted after this time will be considered only as potential change order.

Submittals for proposed substitutions shall include the following information:

a. Name, address, and telephone number of manufacturer and supplier as appropriate.

b. Trade name, model or catalog designation.

c. Product data including performance and test data, reference standards, and technical descriptions of material, product, or equipment. Include color samples and samples of available finishes as appropriate.

d. Detailed comparison with specified products including performance capabilities, warranties, and test results.

e. Other pertinent data including data requested by the Designer to confirm product equality.

If a proposed material, product, or equipment substitution is deemed equal by the Designer to those specified, all bidders of record will be notified by Addendum.

GENERAL CONDITIONS OF THE CONTRACT

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ARTICLE 1 - DEFINITIONS

a. The **contract documents** consist of the Notice to Bidders; Instructions to Bidders; General Conditions of the Contract; special conditions if applicable; Supplementary General Conditions; the drawing and specifications, including all bulletins, addenda or other modifications of the drawings and specifications incorporated into the documents prior to their execution; the proposal; the contract; the performance bond; the payment bond; insurance certificates; the approval of the attorney general; and the certificate of the Office of State Budget and Management. All of these items together form the contract.

b. The **owner** is the State of North Carolina through the agency named in the contract.

c. The **designer(s)** are those referred to within this contract, or their authorized representatives. The Designer(s), as referred to herein, shall mean architect and/or engineer. They will be referred to hereinafter as if each were of the singular number, masculine gender.

d. The **contractor**, as referred to hereinafter, shall be deemed to be either of the several contracting parties called the "Party of the First Part" in either of the several contracts in connection with the total project. Where, in special instances hereinafter, a particular contractor is intended, an adjective precedes the word "contractor," as "general," "heating," etc. For the purposes of a single prime contract, the term Contractor shall be deemed to be the single contracting entity identified as the “Party of the First Part” in the single Construction Contract. Any references or adjectives that name or infer multiple prime contractors shall be interpreted to mean the single prime Contractor.

e. A **subcontractor**, as the term is used herein, shall be understood to be one who has entered into a direct contract with a contractor, and includes one who furnishes materials worked to a special design in accordance with plans and specifications covered by the contract, but does not include one who only sells or furnishes materials not requiring work so described or detailed.

f. **Written notice** shall be defined as notice in writing delivered in person to the contractor, or to a partner of the firm in the case of a partnership, or to a member of the contracting organization, or to an officer of the organization in the case of a corporation, or sent to the last known business address of the contracting organization by registered mail.

g. **Work**, as used herein as a noun, is intended to include materials, labor, and workmanship of the appropriate contractor.

h. The **project** is the total construction work to be performed under the contract documents by the several contractors.

i. **Project Expediter,** as used herein, is an entity stated in the contract documents, designated to effectively facilitate scheduling and coordination of work activities. See Article 14(f) for responsibilities of a Project Expediter. **For the purposes of a single prime contract, the single prime contractor shall be designated as the Project Expediter.**

j. **Change order**, as used herein, shall mean a written order to the contractor subsequent to the signing of the contract authorizing a change in the contract. The change order shall be signed by the contractor, designer and the owner, and approved by the State Construction Office, in that order (Article 19).

k. **Field Order,** as used herein, shall mean a written approval for the contractor to proceed with the work requested by owner prior to issuance of a formal Change Order. The field order shall be signed by the contractor, designer, owner, and State Construction Office.

l. **Time of completion**, as stated in the contract documents, is to be interpreted as consecutive calendar days measured from the date established in the written Notice to Proceed, or such other date as may be established herein (Article 23).

m. **Liquidated damages**, as stated in the contract documents [, is an amount reasonably estimated in advance to cover the consequential damages associated with the Owner's economic loss in not being able to use the Project for its intended purposes at the end of the contract's completion date as amended by change order, if any, by reason of failure of the contractor(s) to complete the work within the time specified. Liquidated damages does not include the Owner's extended contract administration costs (including but not limited to additional fees for architectural and engineering services, testing services, inspection services, commissioning services, etc.), such other damages directly resulting from delays caused solely by the contractor, or consequential damages that the Owner identified in the bid documents that may be impacted by any delay caused soley by the Contractor (e.g., if a multi-phased project-subsequent phases, delays in start other projects that are dependent on the completion of this Project, extension of leases and/or maintenance agreements for other facilities).

n. **Surety**, as used herein, shall mean the bonding company or corporate body which is bound with and for the contractor, and which engages to be responsible for the contractor and his acceptable performance of the work.

o. **Routine written communications between the Designer and the Contractor** are any communication other than a "request for information" provided in letter, memo, or transmittal format, sent by mail, courier, electronic mail, or facsimile. Such communications can not be identified as "request for information".

p. **Clarification or Request for information (RFI)** is a request from the Contractor seeking an interpretation or clarification by the Designer relative to the contract documents. The RFI, which shall be labeled (RFI), shall clearly and concisely set forth the issue or item requiring clarification or interpretation and why the response is needed. The RFI must set forth the Contractor's interpretation or understanding of the contract documents requirements in question, along with reasons for such an understanding.

q. **Approval** means written or imprinted acknowledgement that materials, equipment or methods of construction are acceptable for use in the work**.**

r. **Inspection** shall mean examination or observation of work completed or in progress to determine its compliance with contract documents.

s. **"Equal to" or "approved equal"** shall mean materials, products, equipment, assemblies, or installation methods considered equal by the bidder in all characteristics (physical, functional, and aesthetic) to those specified in the contract documents. Acceptance of equal is subject to approval of Designer and owner.

t. **"Substitution" or "substitute"** shall mean materials, products, equipment, assemblies, or installation methods deviating in at least one characteristic (physical, functional, or aesthetic) from those specified, but which in the opinion of the bidder would improve competition and/or enhance the finished installation. Acceptance of substitution is subject to the approval of the Designer and owner.

u. **Provide** shall mean furnish and install complete in place, new, clean, operational, and ready for use.

v. **Indicated and shown** shall mean provide as detailed, or called for, and reasonably implied in the contract documents.

w. **Special inspector** is one who inspects materials, installation, fabrication, erection or placement of components and connections requiring special expertise to ensure compliance with the approved construction documents and referenced standards.

x. **Commissioning** is a quality assurance process that verifies and documents that building components and systems operate in accordance to the owner's project requirements and the project design documents.

y. **Designer Final Inspection** is the inspection performed by the design team to determine the completeness of the project in accordance with approved plans and specifications. This inspection occurs prior to SCO final inspection.

z. **SCO Final Inspection** is the inspection performed by the State Construction Office to determine the completeness of the project in accordance with NC Building Codes and approved plans and specifications.

aa. **Beneficial Occupancy** is requested by the owner and is occupancy or partial occupancy of the building after all life safety items have been completed as determined by the State Construction Office. Life safety items include but not limited to fire alarm, sprinkler, egress and exit lighting, fire rated walls, egress paths and security.

bb. Final Acceptance is the date in which the State Construction Office accepts the construction as totally complete. This includes the SCO Final Inspection and certification by the designer that all punch lists are completed.

ARTICLE 2 - INTENT AND EXECUTION OF DOCUMENTS

a. The drawings and specifications are complementary, one to the other, and that which is shown on the drawings or called for in the specifications shall be as binding as if it were both called for and shown. The intent of the drawings and specifications is to establish the scope of all labor, materials, transportation, equipment, and any and all other things necessary to provide a bid for a complete job. In case of discrepancy or disagreement in the contract documents, the order of precedence shall be: Form of Contract, specifications, large-scale detail drawings, small-scale drawings.

b. The wording of the specifications shall be interpreted in accordance with common usage of the language except that words having a commonly used technical or trade meaning shall be so interpreted in preference to other meanings.

c. The contractor shall execute each copy of the proposal, contract, performance bond and payment bond as follows:

   1. If the documents are executed by a sole owner, that fact shall be evidenced by the word "Owner" appearing after the name of the person executing them.

   2. If the documents are executed by a partnership, that fact shall be evidenced by the word "Co-Partner" appearing after the name of the partner executing them.

3. If the documents are executed on the part of a corporation, they shall be executed by either the president or the vice president and attested by the secretary or assistant secretary in either case, and the title of the office of such persons shall appear after their signatures. The seal of the corporation shall be impressed on each signature page of the documents.

4. If the documents are made by a joint venture, they shall be executed by each member of the joint venture in the above form for sole owner, partnership or corporation, whichever form is applicable to each particular member.

5. All signatures shall be properly witnessed.

6. If the contractor's license is held by a person other than an owner, partner or officer of a firm, then the licensee shall also sign and be a party to the contract. The title "Licensee" shall appear under his/her signature.

7. The bonds shall be executed by an attorney-in-fact. There shall be attached to each copy of the bond a certified copy of power of attorney properly executed and dated.

8. Each copy of the bonds shall be countersigned by an authorized individual agent of the bonding company licensed to do business in North Carolina. The title "Licensed Resident Agent" shall appear after the signature.

9. The seal of the bonding company shall be impressed on each signature page of the bonds.

10. The contractor's signature on the performance bond and the payment bond shall correspond with that on the contract. The date of performance and payment bond shall not be prior to the date of the contract.

ARTICLE 3 - CLARIFICATIONS AND DETAIL DRAWINGS

a. In such cases where the nature of the work requires clarification by the designer, such clarification shall be furnished by the designer with reasonable promptness by means of written instructions or detail drawings, or both. Clarifications and drawings shall be consistent with the intent of contract documents, and shall become a part thereof.

b. The contractor(s) and the designer shall prepare, if deemed necessary, a schedule fixing dates upon which foreseeable clarifications will be required. The schedule will be subject to addition or change in accordance with progress of the work. The designer shall furnish drawings or clarifications in accordance with that schedule. The contractor shall not proceed with the work without such detail drawings and/or written clarifications.

ARTICLE 4 - COPIES OF DRAWINGS AND SPECIFICATIONS

The designer or Owner shall furnish free of charge to the contractors electronic copies of plans and specifications. If requested by the contractor, paper copies of plans and specifications shall be furnished free of charge as follows:

a. General contractor - Up to twelve (12) sets of general contractor drawings and specifications, up to six (6) sets of which shall include drawings and specifications of all other contracts, plus a clean set of black line prints on white paper of all appropriate drawings, upon which the contractor shall clearly and legibly record all work-in-place that is at variance with the contract documents.

b. Each other contractor - Up to six (6) sets of the appropriate drawings and specifications, up to three (3) sets of which shall include drawings and specifications of all other contracts, plus a clean set of black line prints on white paper of all appropriate drawings, upon which the contractor shall clearly and legibly record all work-in-place that is at variance with the contract documents.

c. Additional sets shall be furnished at cost, including mailing, to the contractor upon request by the contractor. This cost shall be stated in the bidding documents.

d. For the purposes of a single-prime contract, the contractor shall receive up to 30 sets of drawings and specifications, plus a clean set of black line prints on white paper of all appropriate drawings, upon which the contractor shall clearly and legibly record all work-in-place that is at variance with the contract documents.

ARTICLE 5 - SHOP DRAWINGS, SUBMITTALS, SAMPLES, DATA

a. Within 15 consecutive calendar days after the notice to proceed, each prime contractor shall submit a schedule for submission of all shop drawings, product data, samples, and similar submittals through the Project Expediter to the Designer. This schedule shall indicate the items, relevant specification sections, other related submittal, data, and the date when these items will be furnished to the designer.

b. The Contractor(s) shall review, approve and submit to the Designer all Shop Drawings, Coordination Drawings, Product Data, Samples, Color Charts, and similar submittal data required or reasonably implied by the Contract Documents. Required Submittals shall bear the Contractor's stamp of approval, any exceptions to the Contract Documents shall be noted on the submittals, and copies of all submittals shall be of sufficient quantity for the Designer to retain up to three (3) copies of each submittal for his own use plus additional copies as may be required by the Contractor. Submittals shall be presented to the Designer in accordance with the schedule submitted in paragraph (a). so as to cause no delay in the activities of the Owner or of separate Contractors.

c. The Designer shall review required submittals promptly, noting desired corrections if any, and retaining three (3) copies (1 for the Designer, 1 for the owner and 1 for SCO) for his use. The remaining copies of each submittal shall be returned to the Contractor not later than twenty (20) days from the date of receipt by the Designer, for the Contractor's use or for corrections and resubmittal as noted by the Designer. When resubmittals are required, the submittal procedure shall be the same as for the original submittal**s**.

d. Approval of shop drawings/submittals by the Designer shall not be construed as relieving the Contractor from responsibility for compliance with the design or terms of the contract documents nor from responsibility of errors of any sort in the shop drawings, unless such lack of compliance or errors first have been called in writing to the attention of the Designer by the Contractor.

ARTICLE 6 - WORKING DRAWINGS AND SPECIFICATIONS AT THE JOB SITE

a. The contractor shall maintain, in readable condition at his job office, one complete set of working drawings and specifications for his work including all shop drawings. Such drawings and specifications shall be available for use by the designer, his authorized representative, owner or State Construction Office.

b. The contractor shall maintain at the job office, a day-to-day record of work-in-place that is at variance with the contract documents. Such variations shall be fully noted on project drawings by the contractor and submitted to the designer upon project completion and no later than 30 days after final acceptance of the project.

c. The contractor shall maintain at the job office a record of all required tests that have been performed, clearly indicating the scope of work inspected and the date of approval or rejection.

ARTICLE 7 - OWNERSHIP OF DRAWINGS AND SPECIFICATIONS

All drawings and specifications are instruments of service and remain the property of the owner. The use of these instruments on work other than this contract without permission of the owner is prohibited. All copies of drawings and specifications other than contract copies shall be returned to the owner upon request after completion of the work.

ARTICLE 8 - MATERIALS, EQUIPMENT, EMPLOYEES

a. The contractor shall, unless otherwise specified, supply and pay for all labor, transportation, materials, tools, apparatus, lights, power, heat, sanitary facilities, water, scaffolding and incidentals necessary for the completion of his work, and shall install, maintain and remove all equipment of the construction, other utensils or things, and be responsible for the safe, proper and lawful construction, maintenance and use of same, and shall construct in the best and most workmanlike manner, a complete job and everything incidental thereto, as shown on the plans, stated in the specifications, or reasonably implied therefrom, all in accordance with the contract documents.

b. All materials shall be new and of quality specified, except where reclaimed material is authorized herein and approved for use. Workmanship shall at all times be of a grade accepted as the best practice of the particular trade involved, and as stipulated in written standards of recognized organizations or institutes of the respective trades except as exceeded or qualified by the specifications.

c. Upon notice, the contractor shall furnish evidence as to quality of materials.

d. Products are generally specified by ASTM or other reference standard and/or by manufacturer's name and model number or trade name. When specified only by reference standard, the Contractor may select any product meeting this standard, by any manufacturer. When several products or manufacturers are specified as being equally acceptable, the Contractor has the option of using any product and manufacturer combination listed. However, the contractor shall be aware that the cited examples are used only to denote the quality standard of product desired and that they do not restrict bidders to a specific brand, make, manufacturer or specific name; that they are used only to set forth and convey to bidders the general style, type, character and quality of product desired; and that equivalent products will be acceptable. Request for substitution of materials, items, or equipment shall be submitted to the designer for approval or disapproval; such approval or disapproval shall be made by the designer prior to the opening of bids. Alternate materials may be requested after the award if it can clearly be demonstrated that it is an added benefit to the owner and the designer and owner approves.

e. The designer is the judge of equality for proposed substitution of products, materials or equipment.

g. If at any time during the construction and completion of the work covered by these contract documents, the language, conduct, or attire of any workman of the various crafts be adjudged a nuisance to the owner or designer, or if any workman be considered detrimental to the work, the contractor shall order such parties removed immediately from grounds.

ARTICLE 9 - ROYALTIES, LICENSES AND PATENTS

It is the intention of the contract documents that the work covered herein will not constitute in any way infringement of any patent whatsoever unless the fact of such patent is clearly evidenced herein. The contractor shall protect and save harmless the owner against suit on account of alleged or actual infringement. The contractor shall pay all royalties and/or license fees required on account of patented articles or processes, whether the patent rights are evidenced hereinafter.

ARTICLE 10 - PERMITS, INSPECTIONS, FEES, REGULATIONS

a. The contractor shall give all notices and comply with all laws, ordinances, codes, rules and regulations bearing on the conduct of the work under this contract. If the contractor observes that the drawings and specifications are at variance therewith, he shall promptly notify the designer in writing. See Instructions to Bidders, Paragraph 3, Bulletins and Addenda. Any necessary changes required after contract award shall be made by change order in accordance with Article 19. If the contractor performs any work knowing it to be contrary to such laws, ordinances, codes, rules and regulations, and without such notice to the designer, he shall bear all cost arising therefrom. Additional requirements implemented after bidding will be subject to equitable negotiations.

b. All work under this contract shall conform to the North Carolina State Building Code and other State, local and national codes as are applicable. The cost of all required inspections and permits shall be the responsibility of the contractor and included within the bid proposal. All water taps, meter barrels, vaults and impact fees shall be paid by the contractor unless otherwise noted.

d. Projects constructed by the State of North Carolina or by any agency or institution of the State are not subject to inspection by any county or municipal authorities and are not subject to county or municipal building codes. The contractor shall, however, cooperate with the county or municipal authorities by obtaining building permits. Permits shall be obtained at no cost.

e. Projects involving local funding (community colleges) are subject also to county and municipal building codes and inspection by local authorities. The contractor shall pay the cost of these permits and inspections.

ARTICLE 11 - PROTECTION OF WORK, PROPERTY AND THE PUBLIC

a. The contractors shall be jointly responsible for the entire site and the building or construction of the same and provide all the necessary protections, as required by the owner or designer, and by laws or ordinances governing such conditions. They shall be responsible for any damage to the owner's property, or of that of others on the job, by them, their personnel, or their subcontractors, and shall make good such damages. They shall be responsible for and pay for any damages caused to the owner. All contractors shall have access to the project at all times.

b. The contractor shall provide cover and protect all portions of the structure when the work is not in progress, provide and set all temporary roofs, covers for doorways, sash and windows, and all other materials necessary to protect all the work on the building, whether set by him, or any of the subcontractors. Any work damaged through the lack of proper protection or from any other cause, shall be repaired or replaced without extra cost to the owner.

c. No fires of any kind will be allowed inside or around the operations during the course of construction without special permission from the designer and owner.

d. The contractor shall protect all trees and shrubs designated to remain in the vicinity of the operations by building substantial boxes around same. He shall barricade all walks, roads, etc., as directed by the designer to keep the public away from the construction. All trenches, excavations or other hazards in the vicinity of the work shall be well barricaded and properly lighted at night.

e. The contractor shall provide all necessary safety measures for the protection of all persons on the job, including the requirements of the A.G.C. *Accident Prevention Manual in Construction*, as amended, and shall fully comply with all state laws or regulations and North Carolina State Building Code requirements to prevent accident or injury to persons on or about the location of the work. He shall clearly mark or post signs warning of hazards existing, and shall barricade excavations, elevator shafts, stairwells and similar hazards. He shall protect against damage or injury resulting from falling materials and he shall maintain all protective devices and signs throughout the progress of the work.

f. The contractor shall adhere to the rules, regulations and interpretations of the North Carolina Department of Labor relating to Occupational Safety and Health Standards for the Construction Industry (Title 29, Code of Federal Regulations, Part 1926, published in Volume 39, Number 122, Part II, June 24, 1974, *Federal Register*), and revisions thereto as adopted by General Statutes of North Carolina 95-126 through 155.

g. The contractor shall designate a responsible person of his organization as safety officer/inspector to inspect the project site for unsafe health and safety hazards, to report these hazards to the contractor for correction, and whose duties also include accident prevention on the project, and to provide other safety and health measures on the project site as required by the terms and conditions of the contract.The name of the safety inspector shall be made known to the designer and owner at the time of the preconstruction conference and in all cases prior to any work starting on the project.

h. In the event of emergency affecting the safety of life, the protection of work, or the safety of adjoining properties, the contractor is hereby authorized to act at his own discretion, without further authorization from anyone, to prevent such threatened injury or damage.

Any compensation claimed by the contractor on account of such action shall be determined as provided for under Article 19(b).

i. Any and all costs associated with correcting damage caused to adjacent properties of the construction site or staging area shall be borne by the contractor. These costs shall include but not be limited to flooding, mud, sand, stone, debris, and discharging of waste products.

ARTICLE 12 - SEDIMENTATION POLLUTION CONTROL ACT OF 1973

a. Any land-disturbing activity performed by the contractor(s) in connection with the project shall comply with all erosion control measures set forth in the contract documents and any additional measures which may be required in order to ensure that the project is in full compliance with the Sedimentation Pollution Control Act of 1973, as implemented by Title 15, North Carolina Administrative Code, Chapter 4, Sedimentation Control, Subchapters 4A, 4B and 4C, as amended (15 N.C.A.C. 4A, 4B and 4C).

b. Upon receipt of notice that a land-disturbing activity is in violation of said act, the contractor(s) shall be responsible for ensuring that all steps or actions necessary to bring the project in compliance with said act are promptly taken.

c. The contractor(s) shall be responsible for defending any legal actions instituted pursuant to N.C.G.S. 113A-64 against any party or persons described in this article.

d. To the fullest extent permitted by law, the contractor(s) shall indemnify and hold harmless the owner, the designer and the agents, consultants and employees of the owner and designer, from and against all claims, damages, civil penalties, losses and expenses, including, but not limited to, attorneys' fees, arising out of or resulting from the performance of work or failure of performance of work, provided that any such claim, damage, civil penalty, loss or expense is attributable to a violation of the Sedimentation Pollution Control Act. Such obligation shall not be construed to negate, abridge or otherwise reduced any other right or obligation of indemnity which would otherwise exist as to any party or persons described in this article.

ARTICLE 13 - INSPECTION OF THE WORK

a. It is a condition of this contract that the work shall be subject to inspection during normal working hours and during any time work is in preparation and progress by the designer, designated official representatives of the owner, State Construction Office and those persons required by state law to test special work for official approval. The contractor shall therefore provide safe access to the work at all times for such inspections.

b. All instructions to the contractor will be made only by or through the designer or his designated project representative. Observations made by official representatives of the owner shall be conveyed to the designer for review and coordination prior to issuance to the contractor.

c. All work shall be inspected by designer, special inspector and/or State Construction Office prior to being covered by the contractor. Contractor shall give a minimum two weeks notice unless otherwise agreed to by all parties. If inspection fails, after the first reinspection all costs associated with additional reinspections shall be borne by the contractor.

d. Where special inspection or testing is required by virtue of any state laws, instructions of the designer, specifications or codes, the contractor shall give adequate notice to the designer of the time set for such inspection or test, if the inspection or test will be conducted by a party other than the designer. Such special tests or inspections will be made in the presence of the designer, or his authorized representative, and it shall be the contractor's responsibility to serve ample notice of such tests.

e. All laboratory tests shall be paid by the owner unless provided otherwise in the contract documents except the general contractor shall pay for laboratory tests to establish design mix for concrete, and for additional tests to prove compliance with contract documents where materials have tested deficient except when the testing laboratory did not follow the appropriate ASTM testing procedures.

f. Should any work be covered up or concealed prior to inspection and approval by the designer, special inspector, and/or State Construction Office such work shall be uncovered or exposed for inspection, if so requested by the designer in writing. Inspection of the work will be made upon notice from the contractor. All cost involved in uncovering, repairing, replacing, recovering and restoring to design condition, the work that has been covered or concealed will be paid by the contractor involved.

ARTICLE 14 - CONSTRUCTION SUPERVISION AND SCHEDULE

a. Throughout the progress of the work, each contractor shall keep at the job site, a competent superintendent and supervisory staff satisfactory to the designer and the owner. The superintendent and supervisory staff shall not be changed without the consent of the designer and owner unless said superintendent ceases to be employed by the contractor or ceases to be competent as determined by the contractor, designer or owner. The superintendent and other staff designated by the contractor in writing shall have authority to act on behalf of the contractor, and instructions, directions or notices given to him shall be as binding as if given to the contractor. However, directions, instructions, and notices shall be confirmed in writing.

b. The contractor shall examine and study the drawings and specifications and fully understand the project design, and shall provide constant and efficient supervision to the work. Should he discover any discrepancies of any sort in the drawings or specifications, he shall report them to the designer without delay. He will not be held responsible for discrepancies in the drawings and/or specifications, but shall be held responsible to report them should they become known to him.

c. All contractors shall be required to cooperate and consult with each other during the construction of this project. Prior to installation of work, all contractors shall jointly prepare coordination drawings, showing locations of various ductworks, piping, motors, pumps, and other mechanical or electrical equipment, in relation to the structure, walls and ceilings. These drawings shall be submitted to the designer through the Project Expediter for information only. Each contractor shall lay out and execute his work to cause the least delay to other contractors. Each contractor shall be financially responsible for any damage to other contractor's work and for undue delay caused to other contractors on the project.

d. The contractor is required to attend job site progress conferences as called by the designer. The contractor shall be represented at these job progress conferences by both home office and project personnel. These representatives shall have authority to act on behalf of the contractor. These meetings shall be open to subcontractors, material

suppliers and any others who can contribute toward maintaining required job progress. It shall be the principal purpose of these meetings, or conferences, to effect coordination, cooperation and assistance in every practical way toward the end of maintaining progress of the project on schedule and to complete the project within the specified contract time. Each contractor shall be prepared to assess progress of the work as required in his particular contract and to recommend remedial measures for correction of progress as may be appropriate. The designer or his authorized representative shall be the coordinator of the conferences and shall preside as chairman. The contractor shall turn over a copy of his daily reports to the Designer and Owner at the job site progress conference. Owner will determine daily report format.

e The contractor(s) shall, employ an engineer or a land surveyor licensed in the State of North Carolina to lay out the work and to establish a bench mark in a location where same will not be disturbed and where direct instruments sights may be taken.

f. The designer shall designate a Project Expediter on projects involving two or more prime contracts. The Project Expediter shall be designated in the Supplementary General Conditions. The Project Expediter shall have at a minimum the following responsibilities.

1. Prepare the project construction schedule and shall allow all prime contractors (multi-prime contract) and subcontractors (single-prime contract) performing general, plumbing, HVAC, and electrical work equal input into the preparation of the initial construction schedule.

2. Maintain a project progress schedule for all contractors.

3. Give adequate notice to all contractors to ensure efficient continuity of all phases of the work.

4. Notify the designer of any changes in the project schedule.

5. Recommend to the owner whether payment to a contractor shall be approved.

g. It shall be the responsibility of the Project Expediter to cooperate with and obtain from several prime contractors and subcontractors on the job, their respective work activities and integrate these activities into a project construction schedule in form of a detailed bar chart or Critical Path Method (CPM), schedule. Each prime contractor shall provide work activities within fourteen (14) days of request by the Project Expediter. A "work activity", for scheduling purposes, shall be any component or contractual requirement of the project requiring at least one (1) day, but not more than fourteen (14) days, to complete or fulfill. The project construction schedule shall graphically show all salient features of the work required to construct the project from start to finish and within the allotted time established in the contract. The time (in days) between the contractor's early completion and contractual completion dates is part of the project total float time; and shall be used as such, unless amended by a change order. On a multi-prime project, each prime contractor shall review the proposed construction schedule and approve same in writing. The Project Expediter shall submit the proposed construction schedule to the designer for comments. The complete Project construction schedule shall be of the type set forth in the Supplementary General Condition or subparagraph (1) or (2) below, as appropriate:

1. For a project with total contracts of $500,000 or less, a bar chart schedule will satisfy the above requirement. The schedule shall indicate the estimated starting and completion dates for each major element of the work.

2. For a project with total contracts over $500,000, a Critical Path Method (CPM) schedule shall be utilized to control the planning and scheduling of the Work. The CPM schedule shall be the responsibility of the Project Expediter and shall be paid for by the Project Expediter.

Bar Chart Schedule: Where a bar chart schedule is required, it shall be time-scaled in weekly increments, shall indicate the estimated starting and completion dates for each major element of the work by trade and by area, level, or zone, and shall schedule dates for all salient features, including but not limited to the placing of orders for materials, submission of shop drawings and other Submittals for approval, approval of shop drawings by designers, the manufacture and delivery of material, the testing and the installation of materials, supplies and equipment, and all Work activities to be performed by the Contractor. The Contractor shall allow sufficient time in his schedule for all commissioning, required inspections and completion of final punchlist(s). Each Work activity will be assigned a time estimate by the Contractor. One day shall be the smallest time unit used.

CPM Schedule: Where a CPM schedule is required, it shall be in time-scaled precedence format using the Project Expediter's logic and time estimates. The CPM schedule shall be drawn or plotted with activities grouped or zoned by Work area or subcontract as opposed to a random (or scattered) format. The CPM schedule shall be time-scaled on a weekly basis and shall be drawn or plotted at a level of detail and logic which will schedule all salient features of the work to be performed by the Contractor. The Contractor shall allow sufficient time in his schedule for all commissioning, required inspections and completion of final punchlist(s).. Each Work activity will be assigned a time estimate by the Contractor. One day shall be the smallest time unit used.

The CPM schedule will identify and describe each activity, state the duration of each activity, the calendar dates for the early and late start and the early and late finish of each activity, and clearly highlight all activities on the critical path. "Total float" and "free float" shall be indicated for all activities. Float time shall not be considered for the exclusive use or benefit of either the Owner or the Contractor, but must be allocated in the best interest of completing the Work within the Contract time. Extensions to the Contract time, when granted by Change Order, will be granted only when equitable time adjustment exceeds the Total Float in the activity or path of activities affected by the change. On contracts with a price over $2,500,000, the CPM schedule shall also show what part of the Contract Price is attributable to each activity on the schedule, the sum of which for all activities shall equal the total Contract Price.

Early Completion of Project: The Contractor may attempt to complete the project prior to the Contract Completion Date. However, such planned early completion shall be for the Contractor's convenience only and shall not create any additional rights of the Contractor or obligations of the Owner under this Contract, nor shall it change the Time

for Completion or the Contract Completion Date. The Contractor shall not be required to pay liquidated damages to the Owner because of its failure to complete by its planned earlier date. Likewise, the Owner shall not pay the Contractor any additional compensation for early completion nor will the Owner owe the Contractor any compensation should the Owner, its officers, employees, or agents cause the Contractor not to complete earlier than the date required by the Contract Documents.

h. The proposed project construction schedule shall be presented to the designer no later than fifteen (15) days after written notice to proceed. No application for payment will be processed until this schedule is accepted by the designer and owner.

i. The approved project construction schedule shall be distributed to all contractors and displayed at the job site by the Project Expediter.

j. The several contractors shall be responsible for their work activities and shall notify the Project Expediter of any necessary changes or adjustments to their work. The Project Expediter shall maintain the project construction schedule, making biweekly adjustments, updates, corrections, etc., that are necessary to finish the project within the Contract time, keeping all contractors and the designer fully informed. Copy of a bar chart schedule annotated to show the current progress shall be submitted by the Contractor(s) to the designer, along with monthly request for payment. For project requiring CPM schedule, the Contractor shall submit a biweekly report of the status of all activities. The bar chart schedule or status report shall show the actual Work completed to date in comparison with the original Work scheduled for all activities. If any activities of the work of several contractors are behind schedule, the contractor must indicate in writing, what measures will be taken to bring each such activity back on schedule and to ensure that the Contract Completion Date is not exceeded. A plan of action and recovery schedule shall be developed and submitted to the designer by the Project Expediter, when (1) the contractor's report indicates delays, that are in the opinion of the designer or the owner, of sufficient magnitude that the contractor's ability to complete the work by the scheduled completion is brought into question; (2) the updated construction schedule is thirty (30) days behind the planned or baseline schedule and no legitimate time extensions, as determined by the Designer, are in process; and (3) the contractor desires to make changes in the logic (sequencing of work) or the planned duration of future activities of the CPM schedule which, in the opinion of the designer or the owner, are of a major nature. The plan of action, when required shall be submitted to the Owner for review within two (2) business days of the Contractor receiving the Owner's written demand. The recovery schedule, when required, shall be submitted to the Owner within five (5) calendar days of the Contractor's receiving the Owner's written demand. Failure to provide an updated construction schedule or a recovery schedule may be grounds for rejection of payment applications or withholding of funds as set forth in Article 33.

k. The Project Expediter shall notify each contractor of such events or time frames that are critical to the progress of the job. Such notice shall be timely and reasonable. Should the progress be delayed due to the work of any of the several contractors, it shall be the duty of the Project Expediter to immediately notify the contractor(s) responsible for such delay, the designer, the State Construction Office and other prime contractors. The designer shall determine the contractor(s) who caused the delays and notify the bonding company of the responsible contractor(s) of the delays; and shall make a recommendation to the owner regarding further action.

l. Designation as Project Expediter entails an additional project control responsibility and does not alter in any way the responsibility of the contractor so designated, nor the

responsibility of the other contractors involved in the project. The project expeditor's Superintendent(s) shall be in attendance at the Project site at all times when work is in progress unless conditions are beyond the control of the Contractor or until termination of the Contract in accordance with the Contract Documents. It is understood that such Superintendent shall be acceptable to the Owner and Designer and shall be the one who will be continued in that capacity for the duration of the project unless he ceases to be on the Contractor's payroll or the Owner otherwise agrees. The Superintendent shall not be employed on any other project for or by the Contractor or by any other entity during the course of the Work. If the Superintendent is employed by the Contractor on another project without the Owner's approval, then the Owner may deduct from the Contractor's monthly general condition costs and amount representing the Superintendent's cost and shall deduct that amount for each month thereafter until the Contractor has the Superintendent back on the Owner's Project full-time.

ARTICLE 15 - SEPARATE CONTRACTS AND CONTRACTOR RELATIONSHIPS

a. Effective from January 1, 2002, Chapter 143, Article 8, was amended, to allow public contracts to be delivered by the following delivery methods: single-prime, dual (single-prime and separate-prime), construction manager at risk, and alternative contracting method as approved by the State Building Commission. The owner reserves the right to prepare separate specifications, receive separate bids, and award separate contracts for such other major items of work as may be in the best interest of the State. For the purposes of a single prime contract, refer to Article 1 – Definitions.

b. All contractors shall cooperate with each other in the execution of their work, and shall plan their work in such manner as to avoid conflicting schedules or delay of the work. See Article 14, Construction Supervision.

c. If any part of contractor's work depends upon the work of another contractor, defects which may affect that work shall be reported to the designer in order that prompt inspection may be made and the defects corrected. Commencement of work by a contractor where such condition exists will constitute acceptance of the other contractor's work as being satisfactory in all respects to receive the work commenced, except as to defects which may later develop. The designer shall be the judge as to the quality of work and shall settle all disputes on the matter between contractors.

d. Any mechanical or electrical work such as sleeves, inserts, chases, openings, penetrations, etc., which is located in the work of the general contractor shall be built in by the general contractor. The respective mechanical and electrical contractors shall set all sleeves, inserts and other devices that are to be incorporated into the structure in cooperation and under the supervision of the general contractor. The responsibility for the exact location of such items shall be that of the mechanical and/or electrical contractor.

e. The designer and the owner shall have access to the work whenever it is in preparation and progress and during normal working hours. The contractor shall provide facilities for such access so the designer may perform his functions under the contract documents.

f. Should a contractor cause damage to the work or property of another contractor, he shall be directly responsible, and upon notice, shall promptly settle the claim or otherwise resolve the dispute.

ARTICLE 16 - SUBCONTRACTS AND SUBCONTRACTORS

a. Within thirty (30) days after award of the contract, the contractor shall submit to the designer, owner and to the State Construction Office a list giving the names and addresses of subcontractors and equipment and material suppliers he proposes to use, together with the scope of their respective parts of the work. Should any subcontractor be disapproved by the designer or owner, the designer or owner shall submit his reasons for disapproval in writing to the State Construction Office for its consideration with a copy to the contractor. If the State Construction Office concurs with the designer's or owner's recommendation, the contractor shall submit a substitute for approval. The designer and owner shall act promptly in the approval of subcontractors, and when approval of the list is given, no changes of subcontractors will be permitted except for cause or reason considered justifiable by the designer or owner.

b. The designer will furnish to any subcontractor, upon request, evidence regarding amounts of money paid to the contractor on account of the subcontractor's work.

c. The contractor is and remains fully responsible for his own acts or omissions as well as those of any subcontractor or of any employee of either. The contractor agrees that no contractual relationship exists between the subcontractor and the owner in regard to the contract, and that the subcontractor acts on this work as an agent or employee of the contractor.

d. The owner reserves the right to limit the amount of portions of work to be subcontracted as hereinafter specified.

ARTICLE 17 - CONTRACTOR AND SUBCONTRACTOR RELATIONSHIPS

The contractor agrees that the terms of these contract documents shall apply equally to each subcontractor as to the contractor, and the contractor agrees to take such action as may be necessary to bind each subcontractor to these terms. The contractor further agrees to conform to the Code of Ethical Conduct as adopted by the Associated General Contractors of America, Inc., with respect to contractor-subcontractor relationships, and that payments to subcontractors shall be made in accordance with the provisions of G.S. 143-134.1 titled Interest on final payments due to prime contractors: payments to subcontractors.

a. On all public construction contracts which are let by a board or governing body of the state government or any political subdivision thereof, except contracts let by the Department of Transportation pursuant to G.S. 136-28.1, the balance due prime contractors shall be paid in full within 45 days after respective prime contracts of the project have been accepted by the owner, certified by the architect, engineer or designer to be completed in accordance with terms of the plans and specifications, or occupied by the owner and used for the purpose for which the project was constructed, whichever occurs first. Provided, however, that whenever the architect or consulting engineer in charge of the project determines that delay in completion of the project in accordance with terms of the plans and specifications is the fault of the contractor, the project may be occupied and used for the purposes for which it was constructed without payment of any interest on amounts withheld past the 45 day limit. No payment shall be delayed because of the failure of another prime contractor on such project to complete his contract. Should final payment to any prime contractor beyond the date such contracts have been certified to be completed by the designer or architect, accepted by the owner, or occupied by the owner and used for the purposes for which the project was constructed, be delayed by more than 45 days, said prime contractor shall be paid interest, beginning on the 46th day, at the rate of one percent (1%) per month or fraction thereof unless a lower rate is

agreed upon on such unpaid balance as may be due. In addition to the above final payment provisions, periodic payments due a prime contractor during construction shall be paid in accordance with the payment provisions of the contract documents or said prime contractor shall be paid interest on any such unpaid amount at the rate stipulated above for delayed final payments. Such interest shall begin on the date the payment is due and continue until the date on which payment is made. Such due date may be established by the terms of the contract. Funds for payment of such interest on state-owned projects shall be obtained from the current budget of the owning department, institution or agency. Where a conditional acceptance of a contract exists, and where the owner is retaining a reasonable sum pending correction of such conditions, interest on such reasonable sum shall not apply.

b. Within seven days of receipt by the prime contractor of each periodic or final payment, the prime contractor shall pay the subcontractor based on work completed or service provided under the subcontract. Should any periodic or final payment to the subcontractor be delayed by more than seven days after receipt of periodic or final payment by the prime contractor, the prime contractor shall pay the subcontractor interest, beginning on the eighth day, at the rate of one percent (1%) per month or fraction thereof on such unpaid balance as may be due.

c. The percentage of retainage on payments made by the prime contractor to the subcontractor shall not exceed the percentage of retainage on payments made by the owner to the prime contractor. Any percentage of retainage on payments made by the prime contractor to the subcontractor that exceeds the percentage of retainage on payments made by the owner to the prime contractor shall be subject to interest to be paid by the prime contractor to the subcontractor at the rate of one percent (1%) per month or fraction thereof.

d. Nothing in this section shall prevent the prime contractor at the time of application and certification to the owner from withholding application and certification to the owner for payment to the subcontractor for unsatisfactory job progress; defective construction not remedied; disputed work; third-party claims filed or reasonable evidence that claim will be filed; failure of subcontractor to make timely payments for labor, equipment and materials; damage to prime contractor or another subcontractor; reasonable evidence that subcontract cannot be completed for the unpaid balance of the subcontract sum; or a reasonable amount for retainage not to exceed the initial percentage retained by owner.

ARTICLE 18 - DESIGNER'S STATUS

a. The designer shall provide general administration of the performance of construction contracts, including liaison and necessary inspection of the work to ensure compliance with plans and specifications. He is the agent of the owner only for the purpose of constructing this work and to the extent stipulated in the contract documents. He has authority to direct work to be performed, to stop work, to order work removed, or to order corrections of faulty work, where any such action by the designer may be necessary to assure successful completion of the work.

b. The designer is the impartial interpreter of the contract documents, and, as such, he shall exercise his powers under the contract to enforce faithful performance by both the owner and the contractor, taking sides with neither.

c. Should the designer cease to be employed on the work for any reason whatsoever, then the owner shall employ a competent replacement who shall assume the status of the former designer.

d. The designer and his consultants will make inspections of the project. He will inspect the progress, the quality and the quantity of the work.

e. The designer and the owner shall have access to the work whenever it is in preparation and progress during normal working hours. The contractor shall provide facilities for such access so the designer and owner may perform their functions under the contract documents.

f. Based on the designer's inspections and evaluations of the project, the designer shall issue interpretations, directives and decisions as may be necessary to administer the project. His decisions relating to artistic effect and technical matters shall be final, provided such decisions are within the limitations of the contract.

ARTICLE 19 - CHANGES IN THE WORK

a. The owner may have changes made in the work covered by the contract. These changes will not invalidate and will not relieve or release the contractor from any guarantee given by him pertinent to the contract provisions. These changes will not affect the validity of the guarantee bond and will not relieve the surety or sureties of said bond. All extra work shall be executed under conditions of the original contract.

b. Except in an emergency endangering life or property, no change shall be made by the contractor except upon receipt of approved change order or written field order from the designer, countersigned by the owner and the state construction office authorizing such change. No claim for adjustments of the contract price shall be valid unless this procedure is followed.

A field order, transmitted by fax, electronically, or hand delivered, may be used where the change involved impacts the critical path of the work. A formal change order shall be issued as expeditiously as possible.

In the event of emergency endangering life or property, the contractor may be directed to proceed on a time and material basis whereupon the contractor shall proceed and keep accurately on such form as specified by the designer or owner, a correct account of costs together with all proper invoices, payrolls and supporting data. Upon completion of the work the change order will be prepared as outlined under either Method "c(1)" or Method "c(2)" or both.

c. In determining the values of changes, either additive or deductive, contractors are restricted to the use of the following methods:

1. Where the extra work involved is covered by unit prices quoted in the proposal, or subsequently agreed to by the Contractor, Designer, Owner and State Construction Office the value of the change shall be computed by application of unit prices based on quantities, estimated or actual as agreed of the items involved, except is such cases where a quantity exceeds the estimated quantity allowance in the contract by one hundred percent (100%) or more. In such cases, either party may elect to proceed under subparagraph c2 herein. If neither party elects to proceed under c2, then unit prices shall apply.

2. The contracting parties shall negotiate and agree upon the equitable value of the change prior to issuance of the change order, and the change order shall stipulate the corresponding lump sum adjustment to the contract price.

d. Under Paragraph “b” and Methods "c(2)" above, the allowances for overhead and profit combined shall be as follows: all contractors (the single contracting entity (prime), his subcontractors(1st tier subs), or their sub-subcontractors (2nd tier subs, 3rd tier subs, etc)) shall be allowed a maximum of 10% on work they each self-perform; the prime contractor shall be allowed a maximum of 5% on contracted work of his 1st tier sub; 1st tier, 2nd tier, 3rd tier, etc contractors shall be allowed a maximum of 2.5% on the contracted workof their subs. ; Under Method "c(1)", no additional allowances shall be made for overhead and profit. In the case of deductible change orders, under Method "c(2)" and Paragraph (b) above, the contractor shall include no less than five percent (5%) profit, but no allowances for overhead.

e. The term "net cost" as used herein shall mean the difference between all proper cost additions and deductions. The "cost" as used herein shall be limited to the following:

1. The actual costs of materials and supplies incorporated or consumed as part of the work;

2. The actual costs of labor expended on the project site; labor expended in coordination, change order negotiation, record document maintenance, shop drawing revision or other tasks necessary to the administration of the project are considered overhead whether they take place in an office or on the project site.

3. The actual costs of labor burden, limited to the costs of social security (FICA) and Medicare/Medicaid taxes; unemployment insurance costs; health/dental/vision insurance premiums; paid employee leave for holidays, vacation, sick leave, and/or petty leave, not to exceed a total of 30 days per year; retirement contributions; worker’s compensation insurance premiums; and the costs of general liability insurance when premiums are computed based on payroll amounts; the total of which shall not exceed thirty percent (30%) of the actual costs of labor;

4. The actual costs of rental for tools, excluding hand tools; equipment; machinery; and temporary facilities required for the work;

5. The actual costs of premiums for bonds, insurance, permit fees, and sales or use taxes related to the work.

Overtime and extra pay for holidays and weekends may be a cost item only to the extent approved by the owner.

f. Should concealed conditions be encountered in the performance of the work below grade, or should concealed or unknown conditions in an existing structure be at variance with the conditions indicated by the contract documents, the contract sum and time for completion may be equitably adjusted by change order upon claim by either party made within thirty (30) days after the condition has been identified. The cost of such change shall be arrived at by one of the foregoing methods. All change orders shall be supported by a unit cost breakdown showing method of arriving at net cost as defined above.

g. In all change orders, the procedure will be for the designer to request proposals for the change order work in writing. The contractor will provide such proposal and supporting data in suitable format. The designer shall verify correctness. Delay in the processing of the change order due to lack of proper submittal by the contractor of all required supporting data shall not constitute grounds for a time extension or basis of a claim. Within fourteen (14) days after receipt of the contractor’s accepted proposal including all supporting documentation required by the designer, the designer shall prepare the change order and forward to the contractor for his signature or otherwise respond, in writing, to

the contractor's proposal. Within seven (7) days after receipt of the change order executed by the contractor, the designer shall, certify the change order by his signature, and forward the change order and all supporting data to the owner for the owner's signature. The owner shall execute the change order and forward to the State Construction Office for final approval, within seven (7) days of receipt. The State Construction Office shall act on the change order within seven (7) days. In case of emergency or extenuating circumstances, approval of changes may be obtained verbally by telephone or field orders approved by all parties, then shall be substantiated in writing as outlined under normal procedure.

h. At the time of signing a change order, the contractor shall be required to certify as follows:

"I certify that my bonding company will be notified forthwith that my contract has been changed by the amount of this change order, and that a copy of the approved change order will be mailed upon receipt by me to my surety."

i. A change order, when issued, shall be full compensation, or credit, for the work included, omitted or substituted. It shall show on its face the adjustment in time for completion of the project as a result of the change in the work.

j. If, during the progress of the work, the owner requests a change order and the contractor's terms are unacceptable, the owner, with the approval of the State Construction Office, may require the contractor to perform such work on a time and material basis whereupon the contractor shall proceed and keep accurately on such form as specified by the Designer or owner, a correct account of cost together with all proper invoices, payrolls and supporting data. Upon completion of the work a change order will be prepared with allowances for overhead and profit per paragraph d. above and "net cost" and "cost" per paragraph e. above. Without prejudice, nothing in this paragraph shall preclude the owner from performing or to have performed that portion of the work requested in the change order.

ARTICLE 20 - CLAIMS FOR EXTRA COST

a. Should the contractor consider that as a result of instructions given by the designer, he is entitled to extra cost above that stated in the contract, he shall give written notice thereof to the designer within seven (7) days without delay. The written notice shall clearly state that a claim for extra cost is being made and shall provide a detailed justification for the extra cost. The contractor shall not proceed with the work affected until further advised, except in emergency involving the safety of life or property, which condition is covered in Article 19(b) and Article 11(h). No claims for extra compensation shall be considered unless the claim is so made. The designer shall render a written decision within seven (7) days of receipt of claim.

b. The contractor shall not act on instructions received by him from persons other than the designer, and any claims for extra compensation or extension of time on account of such instruction will not be honored. The designer shall not be responsible for misunderstandings claimed by the contractor of verbal instructions which have not been confirmed in writing, and in no case shall instructions be interpreted as permitting a departure from the contract documents unless such instruction is confirmed in writing and supported by a properly authorized change order.

c. Should a claim for extra compensation that complies with the requirements of (a) above by the contractor and is denied by the designer or owner, and cannot be resolved by a

representative of the State Construction Office, the contractor may request a mediation in connection with GS 143-128(f1) in the dispute resolution rules adopted by the State Building Commission (1 N.C.A.C. 30H .0101 through .1001). If the contractor is unable to resolve its claim as a result of mediation, the contractor may pursue the claim in accordance with the provisions of G.S. 143-135.3, or G.S. 143-135.6 where Community Colleges are the owner,and the following:

1. A contractor who has not completed a contract with a board for construction or repair work and who has not received the amount he claims is due under the contract may submit a verified written claim to the director of the State Construction Office of the Department of Administration for the amount the contractor claims is due. The director may deny, allow or compromise the claim, in whole or in part. A claim under this subsection is not a contested case under Chapter 150B of the General Statutes.

2. (a) A contractor who has completed a contract with a board for construction or repair work and who has not received the amount he claims is due under the contract may submit a verified written claim to the director of the State Construction Office of the Department of Administration for the amount the contractor claims is due. The claim shall be submitted within sixty (60) days after the contractor receives a final statement of the board's disposition of his claim and shall state the factual basis for the claim.

   (b) The director shall investigate a submitted claim within ninety (90) days of receiving the claim, or within any longer time period upon which the director and the contractor agree. The contractor may appear before the director, either in person or through counsel, to present facts and arguments in support of his claim. The director may allow, deny or compromise the claim, in whole or in part. The director shall give the contractor a written statement of the director's decision on the contractor's claim.

   (c) A contractor who is dissatisfied with the director's decision on a claim submitted under this subsection may commence a contested case on the claim under Chapter 150B of the General Statutes. The contested case shall be commenced within sixty (60) days of receiving the director's written statement of the decision.

   (d) As to any portion of a claim that is denied by the director, the contractor may, in lieu of the procedures set forth in the preceding subsection of this section, within six (6) months of receipt of the director's final decision, institute a civil action for the sum he claims to be entitled to under the contract by filing a verified complaint and the issuance of a summons in the Superior Court of Wake County or in the superior court of any county where the work under the contract was performed. The procedure shall be the same as in all civil actions except that all issues shall be tried by the judge, without a jury.

ARTICLE 21 - MINOR CHANGES IN THE WORK

The designer will have the authority to order minor changes in the work not involving an adjustment in the contract sum or time for completion, and not inconsistent with the intent of the contract documents. Such changes shall be effected by written order, copied to the State Construction Office, and shall be binding on the owner and the contractor.

ARTICLE 22 - UNCORRECTED FAULTY WORK

Should the correction of faulty or damaged work be considered inadvisable or inexpedient by the owner and the designer, the owner shall be reimbursed by the contractor. A change order will be issued to reflect a reduction in the contract sum.

ARTICLE 23 - TIME OF COMPLETION, DELAYS, EXTENSION OF TIME

a. The time of completion is stated in the Supplementary General Conditions and in the Form of Construction Contract. The Project Expediter, upon notice of award of contract, shall prepare a construction schedule to complete the project within the time of completion as required by Article 14.

b. The contractors shall commence work to be performed under this agreement on a date to be specified in a written Notice to Proceed from the designer and shall fully complete all work hereunder within the time of completion stated. Time is of the essence and the contractor acknowledges the Owner will likely suffer financial damage for failure to complete the work within the time of completion. For each day in excess of the above number of days, the contractor(s) shall pay the owner the sum stated as liquidated damages reasonably estimated in advance to cover the losses to be incurred by the owner by reason of failure of said contractor(s) to complete the work within the time specified, such time being in the essence of this contract and a material consideration thereof.

c. In the event of multiple prime contractors, the designer shall be the judge as to the division of responsibility between the contractor(s), based on the construction schedule, weekly reports and job records, and shall apportion the amount of liquidated damages to be paid by each of them, according to delay caused by any or all of them.

d. If the contractor is delayed at any time in the progress of his work solely by any act or negligence of the owner, the designer, or by any employee of either; by any separate contractor employed by the owner; by changes ordered in the work; by labor disputes at the project site; by abnormal weather conditions not reasonably anticipated for the locality where the work is performed; by unavoidable casualties; by any causes beyond the contractor's control; or by any other causes which the designer and owner determine may justify the delay, then the contract time may be extended by change order only for the time which the designer and owner may determine is reasonable.

   Time extensions will not be granted for rain, wind, snow or other natural phenomena of normal intensity for the locality where work is performed. For purpose of determining extent of delay attributable to unusual weather phenomena, a determination shall be made by comparing the weather for the contract period involved with the average of the preceding five (5) year climatic range during the same time interval based on the National Oceanic and Atmospheric Administration National Weather Service statistics for the locality where work is performed and on daily weather logs kept on the job site by the contractor reflecting the effect of the weather on progress of the work and initialed by the designer's representative. No weather delays shall be considered after the building is dried in unless work claimed to be delayed is on the critical path of the baseline schedule or approved updated schedule. Time extensions for weather delays, acts of God, labor disputes, fire, delays in transportation, unavoidable casualties or other delays which are beyond the control of the Owner do not entitle the Contractor to compensable damages for delays. Any contractor claim for compensable damages for delays is limited to delays caused solely by the owner or its agents. Contractor caused delays shall be accounted for before owner or designer caused delays in the case of concurrent delays.

e. Request for extension of time shall be made in writing to the designer, copies to the owner and SCO, within twenty (20) days following cause of delay. In case of continuing cause for delay, the Contractor shall notify the_Designer to the designer, copies to the owner and SCO, of the delay within 20 days of the beginning of the delay and only one claim is necessary.

f. The contractor shall notify his surety in writing of extension of time granted.

g. No claim for time extension shall be allowed on account of failure of the designer to furnish drawings or instructions until twenty (20) days after demand for such drawings and/or instructions. See Article 5c. Demand must be in written form clearly stating the potential for delay unless the drawings or instructions are provided. Any delay granted will begin after the twenty (20) day demand period is concluded.

ARTICLE 24 - PARTIAL UTILIZATION/BENEFICIAL OCCUPANCY

a. The owner may desire to occupy or utilize all or a portion of the project prior to the completion of the project.

b. Should the owner request a utilization of a building or portion thereof, the designer shall perform a designer final inspection of area after being notified by the contractor that the area is ready for such. After the contractor has completed designer final inspection punch list and the designer has verified, then the designer shall schedule a beneficial occupancy inspection at a time and date acceptable to the owner, contractor(s) and State Construction Office. If beneficial occupancy is granted by the State Construction Office, in such areas the following will be established:

   1. The beginning of guarantees and warranties period for the equipment necessary to support. in the area.

   2. The owner assumes all responsibiliites for utility costs for entire building.

   2. Contractor will obtain consent of surety.

   3. Contractor will obtain endorsement from insurance company permitting beneficial occupancy.

c. The owner shall have the right to exclude the contractor from any part of the project which the designer has so certified to be substantially complete, but the owner will allow the contractor reasonable access to complete or correct work to bring it into compliance with the contract.

d. Occupancy by the owner under this article will in no way relieve the contractor from his contractual requirement to complete the project within the specified time. The contractor will not be relieved of liquidated damages because of beneficial occupancy. The designer may prorate liquidated damages based on the percentage of project occupied.

ARTICLE 25 - FINAL INSPECTION, ACCEPTANCE, AND PROJECT CLOSEOUT

a. Upon notification from the contractor(s) that the project is complete and ready for inspection, the designer shall make a Designer final inspection to verify that the project is complete and ready for SCO final inspection. Prior to SCO final inspection, the contractor(s) shall complete all items requiring corrective measures noted at the Designer

final inspection. The designer shall schedule a SCO final inspection at a time and date acceptable to the owner, contractor(s) and State Construction Office.

b. At the SCO final inspection, the designer and his consultants shall, if job conditions warrant, record a list of items that are found to be incomplete or not in accordance with the contract documents. At the conclusion of the SCO final inspection, the designer and State Construction Office representative shall make one of the following determinations:

   1. That the project is completed and accepted.

   2. That the project will be accepted subject to the correction of the list of discrepancies (punch list). All punch list items must be completed within thirty (30) days of SCO final inspection or the owner may invoke Article 28, Owner's Right to Do Work.

   4. That the project is not complete and another date for a SCO final inspection will be established.

c. Within fourteen (14) days of final acceptance per Paragraph b1 or within fourteen (14) days after completion of punch list per Paragraph b2 above, the designer shall certify the work and issue applicable certificate(s) of compliance.

d. Any discrepancies listed or discovered after the date of SCO final inspection and acceptance under Paragraphs b1 or b2 above shall be handled in accordance with Article 42, Guarantee.

f. The final acceptance date will establish the following:

   1. The beginning of guarantees and warranties period.

   2. The date on which the contractor's insurance coverage for public liability, property damage and builder's risk may be terminated.

   3. That no liquidated damages (if applicable) shall be assessed after this date.

   4. The termination date of utility cost to the contractor.

g. Prior to issuance of final acceptance date, the contractor shall have his authorized representatives visit the project and give full instructions to the designated personnel regarding operating, maintenance, care, and adjustment of all equipment and special construction elements. In addition, the contractor shall provide to the owner a complete instructional video (media format acceptable to the owner) on the operation, maintenance, care and adjustment of all equipment and special construction elements.

ARTICLE 26 - CORRECTION OF WORK BEFORE FINAL PAYMENT

a. Any work, materials, fabricated items or other parts of the work which have been condemned or declared not in accordance with the contract by the designer shall be promptly removed from the work site by the contractor, and shall be immediately replaced by new work in accordance with the contract at no additional cost to the owner. Work or property of other contractors or the owner, damaged or destroyed by virtue of such faulty work, shall be made good at the expense of the contractor whose work is faulty.

b. Correction of condemned work described above shall commence within twenty-four (24) hours after receipt of notice from the designer, and shall make satisfactory progress, as determined by the designer, until completed.

c. Should the contractor fail to proceed with the required corrections, then the owner may complete the work in accordance with the provisions of Article 28.

ARTICLE 27 - CORRECTION OF WORK AFTER FINAL PAYMENT

See Article 35, Performance Bond and Payment Bond, and Article 42, Guarantee**.** Neither the final certificate, final payment, occupancy of the premises by the owner, nor any provision of the contract, nor any other act or instrument of the owner, nor the designer, shall relieve the contractor from responsibility for negligence, or faulty material or workmanship, or failure to comply with the drawings and specifications. Contractor shall correct or make good any defects due thereto and repair any damage resulting there from, which may appear during the guarantee period following final acceptance of the work except as stated otherwise under Article 42, Guarantee. The owner will report any defects as they may appear to the contractor and establish a time limit for completion of corrections by the contractor. The owner will be the judge as to the responsibility for correction of defects.

ARTICLE 28 - OWNER'S RIGHT TO DO WORK

If, during the progress of the work or during the period of guarantee, the contractor fails to prosecute the work properly or to perform any provision of the contract, the owner, after seven (7) days' written notice sent by certified mail, return receipt requested, to the contractor from the designer, may perform or have performed that portion of the work. The cost of the work may be deducted from any amounts due or to become due to the contractor, such action and cost of same having been first approved by the designer. Should the cost of such action of the owner exceed the amount due or to become due the contractor, then the contractor or his surety, or both, shall be liable for and shall pay to the owner the amount of said excess.

ARTICLE 29 - ANNULMENT OF CONTRACT

If the contractor fails to begin the work under the contract within the time specified, or the progress of the work is not maintained on schedule, or the work is not completed within the time above specified, or fails to perform the work with sufficient workmen and equipment or with sufficient materials to ensure the prompt completion of said work, or shall perform the work unsuitably or shall discontinue the prosecution of the work, or if the contractor shall become insolvent or be declared bankrupt or commit any act of bankruptcy or insolvency, or allow any final judgment to stand against him unsatisfied for a period of forty-eight (48) hours, or shall make an assignment for the benefit of creditors, or for any other cause whatsoever shall not carry on the work in an acceptable manner, the owner may give notice in writing, sent by certified mail, return receipt requested, to the contractor and his surety of such delay, neglect or default, specifying the same, and if the contractor within a period of seven (7) days after such notice shall not proceed in accordance therewith, then the owner shall, declare this contract in default, and, thereupon, the surety shall promptly take over the work and complete the performance of this contract in the manner and within the time frame specified. In the event the surety shall fail to take over the work to be done under this contract within seven (7) days after being so notified and notify the owner in writing, sent by certified mail, return receipt requested, that he is taking the same over and stating that he will diligently pursue and complete the same, the owner shall have full power and authority, without violating the contract, to take the prosecution of the work out of the hands of said contractor, to appropriate or use any or all contract materials and equipment on the grounds as may be suitable and acceptable and may enter into an agreement, either by public letting or negotiation, for the completion of said contract according to the terms and provisions thereof

or use such other methods as in his opinion shall be required for the completion of said contract in an acceptable manner. All costs and charges incurred by the owner, together with the costs of completing the work under contract, shall be deducted from any monies due or which may become due said contractor and surety. In case the expense so incurred by the owner shall be less than the sum which would have been payable under the contract, if it had been completed by said contractor, then the said contractor and surety shall be entitled to receive the difference, but in case such expense shall exceed the sum which would have been payable under the contract, then the contractor and the surety shall be liable and shall pay to the owner the amount of said excess.

ARTICLE 30 - CONTRACTOR'S RIGHT TO STOP WORK OR TERMINATE THE CONTRACT

a. Should the work be stopped by order of a court having jurisdiction, or by order of any other public authority for a period of three months, due to cause beyond the fault or control of the contractor, or if the owner should fail or refuse to make payment on account of a certificate issued by the designer within forty-five (45) days after receipt of same, then the contractor, after fifteen (15) days' written notice sent by certified mail, return receipt requested, to the owner and the designer, may suspend operations on the work or terminate the contract.

b. The owner shall be liable to the contractor for the cost of all materials delivered and work performed on this contract plus 10 percent overhead and profit and shall make such payment. The designer shall be the judge as to the correctness of such payment.

ARTICLE 31 - REQUEST FOR PAYMENT

a. Not later than the fifth day of the month, the contractor shall submit to the designer a request for payment for work done during the previous month. The request shall be in the form agreed upon between the contractor and the designer, but shall show substantially the value of work done and materials delivered to the site during the period since the last payment, and shall sum up the financial status of the contract with the following information:

    1. Total of contract including change orders.

    2. Value of work completed to date.

    3. Less five percent (5%) retainage, provided however, that after fifty percent (50%) of the contractor’s work has been satisfactorily completed on schedule, with approval of the owner and the State Construction Office and written consent of the surety, further requirements for retainage will be waived only so long as work continues to be completed satisfactorily and on schedule.

    4. Less previous payments.

    5. Current amount due.

b. The contractor, upon request of the designer, shall substantiate the request with invoices of vouchers or payrolls or other evidence.

c. Prior to submitting the first request, the contractor shall prepare for the designer a schedule showing a breakdown of the contract price into values of the various parts of the work, so arranged as to facilitate payments to subcontractors in accordance with Article 17, Contractor and Subcontractor Relationships. The contractor(s) shall list the

value of each subcontractor and supplier, identifying each minority business subcontractor and supplier as listed in Affidavit C, if applicable.

d. When payment is made on account of stored materials and equipment, such materials must be stored on the owner's property, and the requests for payments shall be accompanied by invoices or bills of sale or other evidence to establish the owner's title to such materials and equipment. Such payments will be made only for materials that have been customized or fabricated specifically for this project. Raw materials or commodity products including but not limited to piping, conduit, CMU, metal studs and gypsum board may not be submitted. Responsibility for such stored materials and equipment shall remain with the contractor regardless of ownership title. Such stored materials and equipment shall not be removed from the owner's property. Should the space for storage on-site be limited, the contractor, at his option, shall be permitted to store such materials and/or equipment in a suitable space off-site. Should the contractor desire to include any such materials or equipment in his application for payment, they must be stored in the name of the owner in an independent, licensed, bonded warehouse approved by the designer, owner and the State Construction Office and located as close to the site as possible. The warehouse selected must be approved by the contractor's bonding and insurance companies; the material to be paid for shall be assigned to the owner and shall be inspected by the designer. Upon approval by the designer, owner and SCO of the storage facilities and materials and equipment, payment therefore will be certified. Responsibility for such stored materials and equipment shall remain with the contractor. Such stored materials and equipment shall not be moved except for transportation to the project site. Under certain conditions, the designer may approve storage of materials at the point of manufacture, which conditions shall be approved by the designer, the owner and the State Construction Office prior to approval for the storage and shall include an agreement by the storing party which unconditionally gives the State absolute right to possession of the materials at anytime. Bond, security and insurance protection shall continue to be the responsibility of the contractor(s).

e. In the event of beneficial occupancy, retainage of funds due the contractor(s) may be reduced with the approval of the State Construction Office to an equitable amount to cover the list of items to be completed or corrected. Retainage may not be reduced to less than two and one-half (2 1/2) times the estimated value of the work to be completed or corrected. Reduction of retainage must be with the consent and approval of the contractor's bonding company.

ARTICLE 32 - CERTIFICATES OF PAYMENT AND FINAL PAYMENT

a. Within five (5) days from receipt of request for payment from the contractor, the designer shall issue and forward to the owner a certificate for payment. This certificate shall indicate the amount requested or as approved by the designer. If the certificate is not approved by the designer, he shall state in writing to the contractor and the owner his reasons for withholding payment.

b. No certificate issued or payment made shall constitute an acceptance of the work or any part thereof. The making and acceptance of final payment shall constitute a waiver of all claims by the owner except:

   1. Claims arising from unsettled liens or claims against the contractor.

   2. Faulty work or materials appearing after final payment.

   3. Failure of the contractor to perform the work in accordance with drawings and specifications, such failure appearing after payment.

4. As conditioned in the performance bond and payment bond.

c. The making and acceptance of final payment shall constitute a waiver of all claims by the contractor except those claims previously made and remaining unsettled (Article 20(c)).

d. Prior to submitting request for final payment to the designer for approval, the contractor shall fully comply with all requirements specified in the" project closeout" section of the specifications. These requirements include but not limited to the following:

1. Submittal of Product and Operating Manuals, Warranties and Bonds, Guarantees, Maintenance Agreements, As-Built Drawings, Certificates of Inspection or Approval from agencies having jurisdiction. (The designer must approve the Manuals prior to delivery to the owner).

2. Transfer of Required attic stock material and all keys in an organized manner.

3. Record of Owner's training.

4. Resolution of any final inspection discrepancies.

5. Granting access to Contractor's records, if Owner's internal auditors have made a request for such access pursuant to Article 52.

e. The contractor shall forward to the designer, the final application for payment along with the following documents:

1. List of minority business subcontractors and material suppliers showing breakdown of contract amounts and total actual payments to subs and material suppliers.

2. Affidavit of Release of Liens.

3. Affidavit of contractors of payment to material suppliers and subcontractors. (See Article 36).

4. Consent of Surety to Final Payment.

5. Certificates of state agencies required by state law.

f. The designer will not authorize final payment until the work under contract has been certified by designer, certificates of compliance issued, and the contractor has complied with the closeout requirements. The designer shall forward the contractor's final application for payment to the owner along with respective certificate(s) of compliance required by law.

ARTICLE 33 - PAYMENTS WITHHELD

a. The designer with the approval of the State Construction Office may withhold payment for the following reasons:

1. Faulty work not corrected.

2. The unpaid balance on the contract is insufficient to complete the work in the judgment of the designer.

3. To provide for sufficient contract balance to cover liquidated damages that will be assessed.

b. The secretary of the Department of Administration may authorize the withholding of payment for the following reasons:

1. Claims filed against the contractor or evidence that a claim will be filed.

2. Evidence that subcontractors have not been paid.

c. The Owner may withhold all or a portion of Contractor's general conditions costs set forth in the approved schedule of values, if Contractor has failed to comply with: (1) a request to access its records by Owner's internal auditors pursuant to Article 52; (2) a request for a plan of action and/or recovery schedule under Article 14.j or provide The Owner; (3) a request to provide an electronic copies of Contractor's baseline schedule, updates with all logic used to create the schedules in the original format of the scheduling software; and (4) Contractor's failure to have its Superintendent on the Project full-time; (

d. When grounds for withholding payments have been removed, payment will be released. Delay of payment due the contractor without cause will make owner liable for payment of interest to the contractor in accordance with G.S. 143-134.1. As provided in G.S.143-134.1(e) the owner shall not be liable for interest on payments withheld by the owner for unsatisfactory job progess, defective construction not remedied, disputed work, or third-party claims filed against the owner or reasonable evidence that a third-party claim will be filed.

ARTICLE 34 - MINIMUM INSURANCE REQUIREMENTS

The work under this contract shall not commence until the contractor has obtained all required insurance and verifying certificates of insurance have been approved in writing by the owner. These certificates shall document that coverages afforded under the policies will not be cancelled, reduced in amount or coverages eliminated until at least thirty (30) days after mailing written notice, by certified mail, return receipt requested, to the insured and the owner of such alteration or cancellation. If endorsements are needed to comply with the notification or other requirements of this article copies of the endorsements shall be submitted with the certificates.

a. **Worker's Compensation and Employer's Liability**

The contractor shall provide and maintain, until final acceptance, workmen's compensation insurance, as required by law, as well as employer's liability coverage with minimum limits of $100,000.

b. **Public Liability and Property Damage**

The contractor shall provide and maintain, until final acceptance, comprehensive general liability insurance, including coverage for premises operations, independent contractors, completed operations, products and contractual exposures, as shall protect such contractors from claims arising out of any bodily injury, including accidental death, as well as from claims for property damages which may arise from operations under this contract, whether such operations be by the contractor or by any subcontractor, or by

anyone directly or indirectly employed by either of them and the minimum limits of such insurance shall be as follows:

Bodily Injury:	$500,000 per occurrence
Property Damage:	$100,000 per occurrence / $300,000 aggregate

In lieu of limits listed above, a $500,000 combined single limit shall satisfy both conditions.

Such coverage for completed operations must be maintained for at least two (2) years following final acceptance of the work performed under the contract.

c. **Property Insurance (Builder's Risk/Installation Floater)**

The contractor shall purchase and maintain property insurance until final acceptance, upon the entire work at the site to the full insurable value thereof. This insurance shall include the interests of the owner, the contractor, the subcontractors and sub-subcontractors in the work and shall insure against the perils of fire, wind, rain, flood, extended coverage, and vandalism and malicious mischief. If the owner is damaged by failure of the contractor to purchase or maintain such insurance, then the contractor shall bear all reasonable costs properly attributable thereto; the contractor shall effect and maintain similar property insurance on portions of the work stored off the site when request for payment per articles so includes such portions.

d. **Deductible**

Any deductible, if applicable to loss covered by insurance provided, is to be borne by the contractor.

e. **Other Insurance**

The contractor shall obtain such additional insurance as may be required by the owner or by the General Statutes of North Carolina including motor vehicle insurance, in amounts not less than the statutory limits.

f. **Proof of Carriage**

The contractor shall furnish the owner with satisfactory proof of carriage of the insurance required before written approval is granted by the owner.

ARTICLE 35 - PERFORMANCE BOND AND PAYMENT BOND

a. Each contractor shall furnish a performance bond and payment bond executed by a surety company authorized to do business in North Carolina. The bonds shall be in the full contract amount. Bonds shall be executed in the form bound with these specifications.

b. All bonds shall be countersigned by an authorized agent of the bonding company who is licensed to do business in North Carolina.

ARTICLE 36 - CONTRACTOR'S AFFIDAVIT

The final payment of retained amount due the contractor on account of the contract shall not become due until the contractor has furnished to the owner through the designer an affidavit signed, sworn and notarized to the effect that all payments for materials, services or subcontracted work in connection with his contract have been satisfied, and that no claims or

liens exist against the contractor in connection with this contract. In the event that the contractor cannot obtain similar affidavits from subcontractors to protect the contractor and the owner from possible liens or claims against the subcontractor, the contractor shall state in his affidavit that no claims or liens exist against any subcontractor to the best of his (the contractor's) knowledge, and if any appear afterward, the contractor shall save the owner harmless.

ARTICLE 37 - ASSIGNMENTS

The contractor shall not assign any portion of this contract nor subcontract in its entirety. Except as may be required under terms of the performance bond or payment bond, no funds or sums of money due or become due the contractor under the contract may be assigned.

ARTICLE 38 - USE OF PREMISES

a. The contractor(s) shall confine his apparatus, the storage of materials and the operations of his workmen to limits indicated by law, ordinances, permits or directions of the designer and owner and shall not exceed those established limits in his operations.

b. The contractor(s) shall not load or permit any part of the structure to be loaded with a weight that will endanger its safety.

c. The contractor(s) shall enforce the designer's and owner's instructions regarding signs, advertisements, fires and smoking.

d. No firearms, any type of alcoholic beverages, or drugs (other than those prescribed by a physician) will be permitted at the job site.

ARTICLE 39 - CUTTING, PATCHING AND DIGGING

a. The contractor shall do all cutting, fitting or patching of his work that may be required to make its several parts come together properly and fit it to receive or be received by work of other contractors shown upon or reasonably implied by the drawings and specifications for the completed structure, as the designer may direct.

b. Any cost brought about by defective or ill-timed work shall be borne by the party responsible therefor.

c. No contractor shall endanger any work of another contractor by cutting, digging or other means. No contractor shall cut or alter the work of any other contractor without the consent of the designer and the affected contractor(s).

ARTICLE 40 - UTILITIES, STRUCTURES, SIGNS

a. The contractor shall provide necessary and adequate facilities for water, electricity, gas, oil, sewer and other utility services which maybe necessary and required for completion of the project including all utilities required for testing, cleaning, balancing, and sterilization of designated plumbing, mechanical and electrical systems. Any permanent meters installed shall be listed in the contractor's name until work has a final acceptance. The contractor will be solely responsible for all utility costs prior to final acceptance. Contractor shall contact all affected utility companies prior to bid to determine their requirements to provide temporary and permanent service and include all costs associated with providing those services in their bid. Coordination of the work of the utility companies during construction is the sole responsibility of the contractor.

b. Meters shall be relisted in the owner's name on the day following final acceptance of the Project Expediter's work, and the owner shall pay for services used after that date.

c. The owner shall be reimbursed for all metered utility charges after the meter is relisted in the owner's name and prior to completion and acceptance of the work of **all** contractors. Reimbursement shall be made by the contractor whose work has not been completed and accepted. If the work of two or more contractors has not been completed and accepted, reimbursement to the owner shall be paid by the contractors involved on the basis of assessments by the designer.

d Prior to the operation of permanent systems, the Project Expediter will provide temporary power, lighting, water, and heat to maintain space temperature above freezing, as required for construction operations.

e. All contractors shall have the permanent building systems in sufficient readiness for furnishing temporary climatic control at the time a building is enclosed and secured. The HVAC systems shall maintain climatic control throughout the enclosed portion of the building sufficient to allow completion of the interior finishes of the building. A building shall be considered enclosed and secured when windows**,** doorways (exterior, mechanical, and electrical equipment rooms), and hardware are installed**;** and other openings have protection which will provide reasonable climatic control. The appropriate time to start the mechanical systems and climatic condition shall be jointly determined by the contractor(s), the designer and owner. Use of the equipment in this manner shall be subject to the approval of the Designer and owner and shall in no way affect the warranty requirements of the contractor(s).

f. The electrical contractor shall have the building's permanent power wiring distribution system in sufficient readiness to provide power as required by the HVAC contractor for temporary climatic control.

g. The electrical contractor shall have the building's permanent lighting system ready at the time the general contractor begins interior painting and shall provide adequate lighting in those areas where interior painting and finishing is being performed.

h. Each prime contractor shall be responsible for his permanently fixed service facilities and systems in use during progress of the work. The following procedures shall be strictly adhered to:

1. Prior to final acceptance of work by the State Construction Office, each contractor shall remove and replace any parts of the permanent building systems damaged through use during construction.

2. Temporary filters as recommended by the equipment manufacturer in order to keep the equipment and ductwork clean and free of dust and debris shall be installed in each of the heating and air conditioning units and at each return grille during construction. New filters shall be installed in each unit prior to the owner's acceptance of the work.

3. Extra effort shall be maintained to keep the building and the site adjacent to the building clean and under no circumstances shall air systems be operated if finishing and site work operations are creating dust in excess of what would be considered normal if the building were occupied.

4. It shall be understood that any warranty on equipment presented to the owner shall extend from the day of final acceptance by the owner. The cost of warranting the

equipment during operation in the finishing stages of construction shall be borne by the contractor whose system is utilized.

5. The electrical contractor shall have all lamps in proper working condition at the time of final project acceptance.

i. The Project Expediter shall provide, if required and where directed, a shed for toilet facilities and shall furnish and install in this shed all water closets required for a complete and adequate sanitary arrangement. These facilities will be available to other contractors on the job and shall be kept in a neat and sanitary condition at all times. Chemical toilets are acceptable.

j. The Project Expediter shall, if required by the Supplementary General Conditions and where directed, erect a temporary field office, complete with lights, telephone, heat and air conditioning. A portion of this office shall be partitioned off, of sufficient size, for the use of a resident inspector, should the designer so direct.

k. On multi-story construction projects, the Project Expediter shall provide temporary elevators, lifts, or other special equipment for the general use of all contractors. The cost for such elevators, lifts or other special equipment and the operation thereof shall be included in the Project Expediter's bid.

l. The Project Expediter will erect one sign on the project if required. The sign shall be of sound construction, and shall be neatly lettered with black letters on white background. The sign shall bear the name of the project, and the names of prime contractors on the project, and the name of the designer and consultants. Directional signs may be erected on the owner's property subject to approval of the owner with respect to size, style and location of such directional signs. Such signs may bear the name of the contractor and a directional symbol. No other signs will be permitted except by permission of the owner.

ARTICLE 41 - CLEANING UP

a. The contractors shall keep the building and surrounding area reasonably free from rubbish at all times, and shall remove debris from the site on a timely basis or when directed to do so by the designer or Project Expediter. The Project Expediter shall provide an on site refuse container(s) for the use of all contractors. Each contractor shall remove their rubbish and debris from the building on a daily basis. The Project Expediter shall broom clean the building as required to minimize dust and dirt accumulation.

b. The Project Expediter shall provide and maintain suitable all-weather access to the building.

c. Before final inspection and acceptance of the building, each contractor shall clean his portion of the work, including glass, hardware, fixtures, masonry, tile and marble (using no acid), clean and wax all floors as specified, and completely prepare the building for use by the owner, with no cleaning required by the owner.

ARTICLE 42 - GUARANTEE

a. The contractor shall unconditionally guarantee materials and workmanship against patent defects arising from faulty materials, faulty workmanship or negligence for a period of twelve (12) months following the date of final acceptance of the work or beneficial occupancy and shall replace such defective materials or workmanship without cost to the owner.

b. Where items of equipment or material carry a manufacturer's warranty for any period in excess of twelve (12) months, then the manufacturer's warranty shall apply for that particular piece of equipment or material. The contractor shall replace such defective equipment or materials, without cost to the owner, within the manufacturer's warranty period.

c. Additionally, the owner may bring an action for latent defects caused by the negligence of the contractor which is hidden or not readily apparent to the owner at the time of beneficial occupancy or final acceptance, whichever occurred first, in accordance with applicable law.

d. Guarantees for roof, equipment, materials, and supplies shall be stipulated in the specifications sections governing such roof, equipment, materials, or supplies.

ARTICLE 43 - CODES AND STANDARDS

Wherever reference is given to codes, standard specifications or other data published by regulating agencies including, but not limited to, national electrical codes, North Carolina state building codes, federal specifications, ASTM specifications, various institute specifications, etc., it shall be understood that such reference is to the latest edition including addenda published prior to the date of the contract documents.

ARTICLE 44 - INDEMNIFICATION

To the fullest extent permitted by law, the contractor shall indemnify and hold harmless the owner, the designer and the agents, consultants and employees of the owner and designer, from and against all claims, damages, losses and expenses, including, but not limited to, attorneys' fees, arising out of or resulting from the performance or failure of performance of the work, provided that any such claim, damage, loss or expense (1) is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the work itself) including the loss of use resulting there from, and (2) is caused in whole or in part by any negligent act or omission of the contractor, the contractor's subcontractor, or the agents of either the contractor or the contractor's subcontractor. Such obligation shall not be construed to negate, abridge or otherwise reduce any other right or obligation of indemnity which would otherwise exist as to any party or person described in this article.

ARTICLE 45 - TAXES

a. Federal excise taxes do not apply to materials entering into state work (Internal Revenue Code, Section 3442(3)).

b. Federal transportation taxes do not apply to materials entering into state work (Internal Revenue Code, Section 3475(b) as amended).

c. North Carolina sales tax and use tax, as required by law, do apply to materials entering into state work and such costs shall be included in the bid proposal and contract sum.

d. Local option sales and use taxes, as required by law, do apply to materials entering into state work as applicable and such costs shall be included in the bid proposal and contract sum.

e. **Accounting Procedures for Refund of County Sales & Use Tax**

Amount of county sales and use tax paid per contractor's statements:

Contractors performing contracts for state agencies shall give the state agency for whose project the property was purchased a signed statement containing the information listed in G.S. 105-164.14(e).

The Department of Revenue has agreed that in lieu of obtaining copies of sales receipts from contractors, an agency may obtain a certified statement as of April 1, 1991 from the contractor setting forth the date, the type of property and the cost of the property purchased from each vendor, the county in which the vendor made the sale and the amount of local sales and use taxes paid thereon. If the property was purchased out-of-state, the county in which the property was delivered should be listed. The contractor should also be notified that the certified statement may be subject to audit.

In the event the contractors make several purchases from the same vendor, such certified statement must indicate the invoice numbers, the inclusive dates of the invoices, the total amount of the invoices, the counties, and the county sales and use taxes paid thereon.

Name of taxing county: The position of a sale is the retailer's place of business located within a taxing county where the vendor becomes contractually obligated to make the sale. Therefore, it is important that the county tax be reported for the county of sale rather than the county of use.

When property is purchased from out-of-state vendors and the county tax is charged, the county should be identified where delivery is made when reporting the county tax.

Such statement must also include the cost of any tangible personal property withdrawn from the contractor's warehouse stock and the amount of county sales or use tax paid thereon by the contractor.

Similar certified statements by his subcontractors must be obtained by the general contractor and furnished to the claimant.
Contractors are not to include any tax paid on supplies, tools and equipment which they use to perform their contracts and should include only those building materials, supplies, fixtures and equipment which actually become a part of or annexed to the building or structure.

ARTICLE 46 - EQUAL OPPORTUNITY CLAUSE

The non-discrimination clause contained in Section 202 (Federal) Executive Order 11246, as amended by Executive Order 11375, relative to equal employment opportunity for all persons without regard to race, color, religion, sex or national origin, and the implementing rules and regulations prescribed by the secretary of Labor, are incorporated herein.

ARTICLE 47 - EMPLOYMENT OF INDIVIDUALS WITH DISABILITIES

The contractor(s) agree not to discriminate against any employee or applicant for employment because of physical or mental disabilities in regard to any position for which the employee or applicant is qualified. The contractor agrees to take affirmative action to employ, advance in employment and otherwise treat qualified individuals with such disabilities without discrimination based upon their physical or mental disability in all employment practices.

ARTICLE 48 - ASBESTOS-CONTAINING MATERIALS (ACM)

The State of North Carolina has attempted to address all asbestos-containing materials that are to be disturbed in the project. However, there may be other asbestos-containing materials in the work areas that are not to be disturbed and do not create an exposure hazard.

Contractors are reminded of the requirements of instructions under Instructions to Bidders and General Conditions of the Contract, titled Examination of Conditions. Statute 130A, Article 19, amended August 3, 1989, established the Asbestos Hazard Management Program that controls asbestos abatement in North Carolina. The latest edition of *Guideline Criteria for Asbestos Abatement* from the State Construction Office is to be incorporated in all asbestos abatement projects for the Capital Improvement Program.

ARTICLE 49 - MINORITY BUSINESS PARTICIPATION

GS 143-128.2 establishes a ten percent (10%) goal for participation by minority businesses in total value of work for each State building project. The document, *Guidelines for Recruitment and Selection of Minority Businesses for Participation in State Construction Contracts* including Affidavits and Appendix E are hereby incorporated into and made a part of this contract.

ARTICLE 50 – CONTRACTOR EVALUATION

The contractor's overall work performance on the project shall be fairly evaluated in accordance with the State Building Commission policy and procedures, for determining qualifications to bid on future State capital improvement projects. In addition to final evaluation, interim evaluation may be prepared during the progress of project. The document, Contractor Evaluation Procedures, is hereby incorporated and made a part of this contract. The owner may request the contractor's comments to evaluate the designer.

ARTICLE 51 – GIFTS

Pursuant to N.C. Gen. Stat. § 133-32, it is unlawful for any vendor or contractor (i.e. architect, bidder, contractor, construction manager, design professional, engineer, subcontractor, supplier, vendor, etc.), to make gifts or to give favors to any State employee. This prohibition covers those vendors and contractors who: (1) have a contract with a governmental agency; or (2) have performed under such a contract within the past year; or (3) anticipate bidding on such a contract in the future. For additional information regarding the specific requirements and exemptions, vendors and contractors are encouraged to review G.S. Sec. 133-32.

During the construction of the Project, the Contractor is prohibited from making gifts to any of the Owner's employees, Owner's project representatives (architect, engineers, construction manager and their employees), employees of the State Construction Office and/or any other State employee that may have any involvement, influence, responsibilities, oversight, management and/or duties that pertain to and/or relate to the contract administration, financial administration and/or disposition of claims arising from and/or relating to the Contract and/or Project.

ARTICLE 52 – AUDITING-ACCESS TO PERSONS AND RECORDS

In accordance with N.C. General Statute 147-64.7, the State Auditor shall have access to Contractor's officers, employees, agents and/or other persons in control of and/or responsible for the Contractor's records that relate to this Contracts for purposes of conducting audits under the referenced statute. The Owner's internal auditors shall also have the right to access and copy the Contractor's records relating to the Contract and Project during the term of the Contract and within two years following the completion of the Project/close-out of the Contract to verify accounts, accuracy, information, calculations and/or data affecting and/or

relating to Contractor's requests for payment, requests for change orders, change orders, claims for extra work, requests for time extensions and related claims for delay/extended general conditions costs, claims for lost productivity, claims for loss efficiency, claims for idle equipment or labor, claims for price/cost escalation, pass-through claims of subcontractors and/or suppliers, and/or any other type of claim for payment or damages from Owner and/or its project representatives.

ARTICLE 53 – NORTH CAROLINA FALSE CLAIMS ACT

The North Carolina False Claims Act ("NCFCA"), N.C Gen. Stat. § 1-605 through 1-618, applies to this Contract. The Contractor should familiarize itself with the entire NCFCA and should seek the assistance of an attorney if it has any questions regarding the NCFCA and its applicability to any requests, demands and/or claims for payment its submits to the State through the contracting state agency, institution, university or community college.

The purpose of the NCFCA "is to deter persons from knowingly causing or assisting in causing the State to pay claims that are false or fraudulent and to provide remedies in the form of treble damages and civil penalties when money is obtained from the State by reason of a false or fraudulent claim." (Section 1-605(b).) A contractor's liability under the NCFCA may arise from, but is not limited to: requests for payment, invoices, billing, claims for extra work, requests for change orders, requests for time extensions, claims for delay damages/extended general conditions costs, claims for loss productivity, claims for loss efficiency, claims for idle equipment or labor, claims for price/cost escalation, pass-through claims of subcontractors and/or suppliers, documentation used to support any of the foregoing requests or claims, and/or any other request for payment from the State through the contracting state agency, institution, university or community college. The parts of the NCFCA that are most likely to be enforced with respect to this type of contract are as follows:

- A "claim" is "[a]ny request or demand, whether under a contract or otherwise, for money or property and whether or not the State has title to the money or property that (i) is presented to an officer, employee, or agent of the State or (ii) is made to a contractor … if the money or property is to be spent or used on the State's behalf or to advance a State program or interest and if the State government: (a) provides or has provided any portion of the money or property that is requested or demanded; or (b) will reimburse such contractor … for any portion of the money or property which is requested or demanded." (Section 1-606(2).)

- "Knowing" and "knowingly." – Whenever a person, with respect to information, does any of the following: (a) Has actual knowledge of the information; (b) Acts in deliberate ignorance of the truth or falsity of the information; and/or (c) Acts in reckless disregard of the truth or falsity of the information. (Section 1-606(4).) Proof of specific intent to defraud is not required. (Section 1-606(4).)

- "Material" means having a natural tendency to influence, or be capable of influencing, the payment or receipt of money or property. (Section 1-606(4).)

- Liability. – "Any person who commits any of the following acts shall be liable to the State for three times the amount of damages that the State sustains because of the act of that person[:] … (1) Knowingly presents or causes to be presented a false or fraudulent claim for payment or approval. (2) Knowingly makes, uses, or causes to be made or used, a false record or statement material to a false or fraudulent claim. (3) Conspires to commit a violation of subdivision (1), (2) …" (Section 1-607(a)(1), (2).)

- The NCFCA shall be interpreted and construed so as to be consistent with the federal False Claims Act, 31 U.S.C. § 3729, et seq., and any subsequent amendments to that act. (Section 1-616(c).)

Finally, the contracting state agency, institution, university or community college may refer any suspected violation of the NCFCA by the Contractor to the Attorney General's Office for investigation. Under Section 1-608(a), the Attorney General is responsible for investigating any violation of NCFCA, and may bring a civil action against the Contractor under the NCFCA. The Attorney General's investigation and any civil action relating thereto are independent and not subject to any dispute resolution provision set forth in this Contract. (See Section 1-608(a).)

ARTICLE 54 – TERMINATION FOR CONVENIENCE

Owner may at any time and for any reason terminate Contractor's services and work at Owner's convenience. Upon receipt of such notice, Contractor shall, unless the notice directs otherwise, immediately discontinue the work and placing of orders for materials, facilities and supplies in connection with the performance of this Agreement.

Upon such termination, Contractor shall be entitled to payment only as follows: (1) the actual cost of the work completed in conformity with this Agreement; plus, (2) such other costs actually incurred by Contractor as are permitted by the prime contract and approved by Owner; (3) plus ten percent (10%) of the cost of the work referred to in subparagraph (1) above for overhead and profit. There shall be deducted from such sums as provided in this subparagraph the amount of any payments made to Contractor prior to the date of the termination of this Agreement. Contractor shall not be entitled to any claim or claim of lien against Owner for any additional compensation or damages in the event of such termination and payment.

SECTION 00 7300
SUPPLEMENTARY GENERAL CONDITIONS

PART 1 GENERAL

1.01 SUMMARY

A. These Supplementary Conditions amend and supplement the General Conditions of the Contract provided herein and other provisions of the Contract Documents as indicated below. All provisions that are not so amended or supplemented remain in full force and effect.

B. The terms used in these Supplementary Conditions that are defined in the General Conditions have the meanings assigned to them in the General Conditions.

1.02 MODIFICATIONS TO GENERAL CONDITIONS

A. Article 1 - Definitions
   1. Add to Paragraph a.: The following drawings and project manual form a part of the Contract Documents:
      a. Sheets T-1, C1.0, C1.1, SP-1, A-1 through A-4, S0.1, S1.1, S1.2, S2.1, S4.1, P0.1, P1.0, M0.1, M1.0, E0.1 through E0.3, E1.0 and E1.1 of the Drawings.
      b. The Specifications, Divisions 1 through 11, 22, 23, 26, 31 and 32 as included in the Project Manual.
   2. Revise Paragraph B to read: The **Owner** referred to throughout these documents shall be **North Carolina Department of Transportation**.

B. Article 2 - Intent and Execution of Documents
   1. Add to Paragraph a: Drawings are not to be scaled for dimensions not shown. Where adjustments are necessary to suit field conditions, or where additional dimensions or other clarification is required, the Contractor shall promptly request such clarifications from the Designer.

C. Article 5 - Shop Drawings, Submittals, Samples, Data
   1. Add to Paragraph b: “Contractor shall submit shop drawings, coordination drawings and product data via electronic (pdf) format to the Designer for review and approval.”

D. Article 11 - Protection of Work, Property and the Public
   1. Existing Utilities: The Contractor shall comply with provision of "Underground Utility Safety and Damage Prevention Act" enacted by NC General Assembly. Use care to avoid damaging any underground utilities, especially those in any public right-of-way or private easement owned by a utility company. Note such underground utilities shown on drawings, if any. Those shown do not necessarily represent all that may occur. Contractor shall be responsible for the protection of underground and overhead utilities in his work area which are shown on the Drawings and/or which can be detected by a visual inspection of the job site.

E. Article 23 - Liquidated Damages and Construction Scheduling
   1. **Time of Completion**: The Contractor shall commence work to be performed under this agreement on a date to be specified in a written Notice To Proceed from the Designer and shall fully complete all work hereunder within 180 Consecutive Calendar Days from the date of the Notice to Proceed.
   2. **Liquidated Damages**: For each calendar day in excess of the above number of days, the contractor shall pay the owner the sum of Five Hundred Dollars ($500) per day as liquidated damages reasonably estimated in advance to cover the losses to be incurred by the owner by reason of failure of said contractor to complete the work within the time specified, such time being in the essence of this contract and a material consideration thereof.

F. Article 31 - Request for Payments
   1. Applications for payment shall be “wet seal” originals and rendered on AIA Document G702, Application and Certificate for Payment. Five original copies are required. Copies of the form are available for inspection at the office of the Architect.

G. Article 40 – Utilities, Structures, Signs
   1. The Owner will provide electric and water as needed for the project at no additional cost, unless noted otherwise and as available during construction, provided the Contractor’s use of utilities is not abusive. Owner is not responsible for providing utilities should they not be available for any reason during construction. The cost of securing the use of utilities to the point of use shall be by the contractor.
   2. Temporary toilet facilities are required for this project.

END OF DOCUMENT

GUIDELINES FOR RECRUITMENT AND SELECTION OF MINORITY BUSINESSES FOR PARTICIPATION IN STATE CONSTRUCTION CONTRACTS

In accordance with G.S. 143-128.2 (effective January 1, 2002) these guidelines establish goals for minority participation in single-prime bidding, separate-prime bidding, construction manager at risk, and alternative contracting methods, on State construction projects in the amount of $300,000 or more. The legislation provides that the State shall have a verifiable ten percent (10%) goal for participation by minority businesses in the total value of work for each project for which a contract or contracts are awarded. These requirements are published to accomplish that end.

SECTION A: INTENT

It is the intent of these guidelines that the State of North Carolina, as awarding authority for construction projects, and the contractors and subcontractors performing the construction contracts awarded shall cooperate and in good faith do all things legal, proper and reasonable to achieve the statutory goal of ten percent (10%) for participation by minority businesses in each construction project as mandated by GS 143-128.2. Nothing in these guidelines shall be construed to require contractors or awarding authorities to award contracts or subcontracts to or to make purchases of materials or equipment from minority-business contractors or minority-business subcontractors who do not submit the lowest responsible, responsive bid or bids.

SECTION B: DEFINITIONS

1. Minority - a person who is a citizen or lawful permanent resident of the United States and who is:
   a. Black, that is, a person having origins in any of the black racial groups in Africa;
   b. Hispanic, that is, a person of Spanish or Portuguese culture with origins in Mexico, South or Central America, or the Caribbean Islands, regardless of race;
   c. Asian American, that is, a person having origins in any of the original peoples of the Far East, Southeast Asia and Asia, the Indian subcontinent, the Pacific Islands;
   d. American Indian, that is, a person having origins in any of the original peoples of North America; or
   e. Female

2. Minority Business - means a business:
   a. In which at least fifty-one percent (51%) is owned by one or more minority persons, or in the case of a corporation, in which at least fifty-one percent (51%) of the stock is owned by one or more minority persons or socially and economically disadvantaged individuals; and
   b. Of which the management and daily business operations are controlled by one or more of the minority persons or socially and economically disadvantaged individuals who own it.

3. Socially and economically disadvantaged individual - means the same as defined in 15 U.S.C. 637. "Socially disadvantaged individuals are those who have been subjected to racial or ethnic prejudice or cultural bias because of their identity as a member of a group without regard to their individual qualities". "Economically disadvantaged individuals are those socially disadvantaged individuals whose ability to compete in the free enterprise system has been impaired due to diminished capital and credit opportunities as compared to others in the same business area who are not socially disadvantaged".

4. Public Entity - means State and all public subdivisions and local governmental units.

5. Owner - The State of North Carolina, through the Agency/Institution named in the contract.

6. Designer – Any person, firm, partnership, or corporation, which has contracted with the State of North Carolina to perform architectural or engineering, work.

7. Bidder - Any person, firm, partnership, corporation, association, or joint venture seeking to be awarded a public contract or subcontract.

8. Contract - A mutually binding legal relationship or any modification thereof obligating the seller to furnish equipment, materials or services, including construction, and obligating the buyer to pay for them.

9. Contractor - Any person, firm, partnership, corporation, association, or joint venture which has contracted with the State of North Carolina to perform construction work or repair.

10. Subcontractor - A firm under contract with the prime contractor or construction manager at risk for supplying materials or labor and materials and/or installation. The subcontractor may or may not provide materials in his subcontract.

SECTION C: RESPONSIBILITIES

1. Office for Historically Underutilized Businesses, Department of Administration (hereinafter referred to as HUB Office).

   The HUB Office has established a program, which allows interested persons or businesses qualifying as a minority business under G.S. 143-128.2, to obtain certification in the State of North Carolina procurement system. The information provided by the minority businesses will be used by the HUB Office to:
   a. Identify those areas of work for which there are minority businesses, as requested.
   b. Make available to interested parties a list of prospective minority business contractors and subcontractors.
   c. Assist in the determination of technical assistance needed by minority business contractors.

   In addition to being responsible for the certification/verification of minority businesses that want to participate in the State construction program, the HUB Office will:
   (1) Maintain a current list of minority businesses. The list shall include the areas of work in which each minority business is interested.
   (2) Inform minority businesses on how to identify and obtain contracting and subcontracting opportunities through the State Construction Office and other public entities.
   (3) Inform minority businesses of the contracting and subcontracting process for public construction building projects.
   (4) Work with the North Carolina trade and professional organizations to improve the ability of minority businesses to compete in the State construction projects.
   (5) The HUB Office also oversees the minority business program by:
      a. Monitoring compliance with the program requirements.
      b. Assisting in the implementation of training and technical assistance programs.
      c. Identifying and implementing outreach efforts to increase the utilization of minority businesses.
      d. Reporting the results of minority business utilization to the Secretary of the Department of Administration, the Governor, and the General Assembly.

2. State Construction Office
   The State Construction Office will be responsible for the following:

   a. Furnish to the HUB Office a minimum of twenty-one days prior to the bid opening the following:
      (1) Project description and location;
      (2) Locations where bidding documents may be reviewed;
      (3) Name of a representative of the owner who can be contacted during the advertising period to advise who the prospective bidders are;
      (4) Date, time and location of the bid opening.
      (5) Date, time and location of prebid conference, if scheduled.

   b. Attending scheduled prebid conference, if necessary, to clarify requirements of the general statutes regarding minority-business participation, including the bidders' responsibilities.

c. Reviewing the apparent low bidders' statutory compliance with the requirements listed in the proposal, that must be complied with, if the bid is to be considered as responsive, prior to award of contracts. The State reserves the right to reject any or all bids and to waive informalities.
d. Reviewing of minority business requirements at Preconstruction conference.
e. Monitoring of contractors' compliance with minority business requirements in the contract documents during construction.
f. Provide statistical data and required reports to the HUB Office.
g. Resolve any protest and disputes arising after implementation of the plan, in conjunction with the HUB Office.

3. Owner
Before awarding a contract, owner shall do the following:

a. Develop and implement a minority business participation outreach plan to identify minority businesses that can perform public building projects and to implement outreach efforts to encourage minority business participation in these projects to include education, recruitment, and interaction between minority businesses and non-minority businesses.
b. Attend the scheduled prebid conference.
c. At least 10 days prior to the scheduled day of bid opening, notify minority businesses that have requested notices from the public entity for public construction or repair work and minority businesses that otherwise indicated to the Office for Historically Underutilized Businesses an interest in the type of work being bid or the potential contracting opportunities listed in the proposal. The notification shall include the following:
    1. A description of the work for which the bid is being solicited.
    2. The date, time, and location where bids are to be submitted.
    3. The name of the individual within the owner's organization who will be available to answer questions about the project.
    4. Where bid documents may be reviewed.
    5. Any special requirements that may exist.
d. Utilize other media, as appropriate, likely to inform potential minority businesses of the bid being sought.
e. Maintain documentation of any contacts, correspondence, or conversation with minority business firms made in an attempt to meet the goals.
f. Review, jointly with the designer, all requirements of G.S. 143-128.2(c) and G.S. 143-128.2(f) – (i.e. bidders' proposals for identification of the minority businesses that will be utilized with corresponding total dollar value of the bid and affidavit listing good faith efforts, or affidavit of self-performance of work, if the contractor will perform work under contract by its own workforce) - prior to recommendation of award to the State Construction Office.
g. Evaluate documentation to determine good faith effort has been achieved for minority business utilization prior to recommendation of award to State Construction Office.
h. Review prime contractors' pay applications for compliance with minority business utilization commitments prior to payment.
i. Make documentation showing evidence of implementation of Owner's responsibilities available for review by State Construction Office and HUB Office, upon request

4. Designer
Under the single-prime bidding, separate prime bidding, construction manager at risk, or alternative contracting method, the designer will:

a. Attend the scheduled prebid conference to explain minority business requirements to the prospective bidders.
b. Assist the owner to identify and notify prospective minority business prime and subcontractors of potential contracting opportunities.
c. Maintain documentation of any contacts, correspondence, or conversation with minority business firms made in an attempt to meet the goals.
d. Review jointly with the owner, all requirements of G.S. 143-128.2(c) and G.S.143-128.2(f) – (i.e. bidders' proposals for identification of the minority businesses that will be utilized with

corresponding total dollar value of the bid and affidavit listing Good Faith Efforts, or affidavit of self-performance of work, if the contractor will perform work under contract by its own workforce) - prior to recommendation of award.

e. During construction phase of the project, review "MBE Documentation for Contract Payment" – (Appendix E) for compliance with minority business utilization commitments. Submit Appendix E form with monthly pay applications to the owner and forward copies to the State Construction Office.
f. Make documentation showing evidence of implementation of Designer's responsibilities available for review by State Construction Office and HUB Office, upon request.

5. Prime Contractor(s), CM at Risk, and Its First-Tier Subcontractors
Under the single-prime bidding, the separate-prime biding, construction manager at risk and alternative contracting methods, contractor(s) will:

a. Attend the scheduled prebid conference.
b. Identify or determine those work areas of a subcontract where minority businesses may have an interest in performing subcontract work.
c. At least ten (10) days prior to the scheduled day of bid opening, notify minority businesses of potential subcontracting opportunities listed in the proposal. The notification will include the following:
   (1) A description of the work for which the subbid is being solicited.
   (2) The date, time and location where subbids are to be submitted.
   (3) The name of the individual within the company who will be available to answer questions about the project.
   (4) Where bid documents may be reviewed.
   (5) Any special requirements that may exist, such as insurance, licenses, bonds and financial arrangements.

   If there are more than three (3) minority businesses in the general locality of the project who offer similar contracting or subcontracting services in the specific trade, the contractor(s) shall notify three (3), but may contact more, if the contractor(s) so desires.
d. During the bidding process, comply with the contractor(s) requirements listed in the proposal for minority participation.
e. Identify on the bid, the minority businesses that will be utilized on the project with corresponding total dollar value of the bid and affidavit listing good faith efforts as required by G.S. 143-128.2(c) and G.S. 143-128.2(f).
f. Make documentation showing evidence of implementation of PM, CM-at-Risk and First-Tier Subcontractor responsibilities available for review by State Construction Office and HUB Office, upon request.
g. Upon being named the apparent low bidder, the Bidder shall provide one of the following: (1) an affidavit (Affidavit C) that includes a description of the portion of work to be executed by minority businesses, expressed as a percentage of the total contract price, which is equal to or more than the applicable goal; (2) if the percentage is not equal to the applicable goal, then documentation of all good faith efforts taken to meet the goal. Failure to comply with these requirements is grounds for rejection of the bid and award to the next lowest responsible and responsive bidder.
h. The contractor(s) shall identify the name(s) of minority business subcontractor(s) and corresponding dollar amount of work on the schedule of values. The schedule of values shall be provided as required in Article 31 of the General Conditions of the Contract to facilitate payments to the subcontractors.
i. The contractor(s) shall submit with each monthly pay request(s) and final payment(s), "MBE Documentation for Contract Payment" – (Appendix E), for designer's review.
j. During the construction of a project, at any time, if it becomes necessary to replace a minority business subcontractor, immediately advise the owner, State Construction Office, and the Director of the HUB Office in writing, of the circumstances involved. The prime contractor shall make a good faith effort to replace a minority business subcontractor with another minority business subcontractor.

k. If during the construction of a project additional subcontracting opportunities become available, make a good faith effort to solicit subbids from minority businesses.
l. It is the intent of these requirements apply to all contractors performing as prime contractor and first tier subcontractor under construction manager at risk on state projects.

6. Minority Business Responsibilities
While minority businesses are not required to become certified in order to participate in the State construction projects, it is recommended that they become certified and should take advantage of the appropriate technical assistance that is made available. In addition, minority businesses who are contacted by owners or bidders must respond promptly whether or not they wish to submit a bid.

SECTION 4: DISPUTE PROCEDURES
It is the policy of this state that disputes that involves a person's rights, duties or privileges, should be settled through informal procedures. To that end, minority business disputes arising under these guidelines should be resolved as governed under G.S. 143-128(g).

SECTION 5: These guidelines shall apply upon promulgation on state construction projects. Copies of these guidelines may be obtained from the Department of Administration, State Construction Office, (physical address) 301 North Wilmington Street, Suite 450, NC Education Building, Raleigh, North Carolina, 27601-2827, (mail address) 1307 Mail Service Center, Raleigh, North Carolina, 27699-1307, phone (919) 807-4100, Website: www.nc-sco.com

SECTION 6: In addition to these guidelines, there will be issued with each construction bid package provisions for contractual compliance providing minority business participation in the state construction program.

MINORITY BUSINESS CONTRACT PROVISIONS (CONSTRUCTION)

APPLICATION:

The **Guidelines for Recruitment and Selection of Minority Businesses for Participation in State Construction Contracts** are hereby made a part of these contract documents. These guidelines shall apply to all contractors regardless of ownership. Copies of these guidelines may be obtained from the Department of Administration, State Construction Office, (physical address) 301 North Wilmington Street, Suite 450, NC Education Building, Raleigh, North Carolina, 27601-2827, (mail address) 1307 Mail Service Center, Raleigh, North Carolina, 27699-1307, phone (919) 807-4100, Website: http://www.nc-sco.com

MINORITY BUSINESS SUBCONTRACT GOALS:

The goals for participation by minority firms as subcontractors on this project have been set at 10%.

The bidder must identify on its bid, the minority businesses that will be utilized on the project with corresponding total dollar value of the bid and affidavit (Affidavit A) listing good faith efforts **or** affidavit (Affidavit B) of self-performance of work, if the bidder will perform work under contract by its own workforce, as required by G.S. 143-128.2(c) and G.S. 143-128.2(f).

The lowest responsible, responsive bidder must provide Affidavit C, that includes a description of the portion of work to be executed by minority businesses, expressed as a percentage of the total contract price, which is equal to or more than the applicable goal.

OR

Provide Affidavit D, that includes a description of the portion of work to be executed by minority businesses, expressed as a percentage of the total contract price, **with documentation of Good Faith Effort, if the percentage is not equal to the applicable goal.**

OR

Provide Affidavit B, which includes sufficient information for the State to determine that the bidder does not customarily subcontract work on this type project.

The above information must be provided as required. Failure to submit these documents is grounds for rejection of the bid.

MINIMUM COMPLIANCE REQUIREMENTS:

All written statements, affidavits or intentions made by the Bidder shall become a part of the agreement between the Contractor and the State for performance of this contract. Failure to comply with any of these statements, affidavits or intentions, or with the minority business Guidelines shall constitute a breach of the contract. A finding by the State that any information submitted either prior to award of the contract or during the performance of the contract is inaccurate, false or incomplete, shall also constitute a breach of the contract. Any such breach may result in termination of the contract in accordance with the termination provisions contained in the contract. It shall be solely at the option of the State whether to terminate the contract for breach.

In determining whether a contractor has made Good Faith Efforts, the State will evaluate all efforts made by the Contractor and will determine compliance in regard to quantity, intensity, and results of these efforts. Good Faith Efforts include:

(1) Contacting minority businesses that reasonably could have been expected to submit a quote and that were known to the contractor or available on State or local government maintained lists at least 10 days before the bid or proposal date and notifying them of the nature and scope of the work to be performed.

(2) Making the construction plans, specifications and requirements available for review by prospective minority businesses, or providing these documents to them at least 10 days before the bid or proposals are due.

(3) Breaking down or combining elements of work into economically feasible units to facilitate minority participation.

(4) Working with minority trade, community, or contractor organizations identified by the Office for Historically Underutilized Businesses and included in the bid documents that provide assistance in recruitment of minority businesses.

(5) Attending any prebid meetings scheduled by the public owner.

(6) Providing assistance in getting required bonding or insurance or providing alternatives to bonding or insurance for subcontractors.

(7) Negotiating in good faith with interested minority businesses and not rejecting them as unqualified without sound reasons based on their capabilities. Any rejection of a minority business based on lack of qualification should have the reasons documented in writing.

(8) Providing assistance to an otherwise qualified minority business in need of equipment, loan capital, lines of credit, or joint pay agreements to secure loans, supplies, or letters of credit, including waiving credit that is ordinarily required. Assisting minority businesses in obtaining the same unit pricing with the bidder's suppliers in order to help minority businesses in establishing credit.

(9) Negotiating joint venture and partnership arrangements with minority businesses in order to increase opportunities for minority business participation on a public construction or repair project when possible.

(10) Providing quick pay agreements and policies to enable minority contractors and suppliers to meet cash-flow demands.

Construction Term Abbreviations

# or No.	Number or Pound
&	and
@	at
Ø	Diameter
%	Percent
A.B.	Anchor Bolt
Adj.	Adjustable
Alum.	Aluminum
Approx.	Approximate
Bldg	Building
CJ	Control Joint
C	Centerline
CMU	Concrete Masonry Unit
Conc.	Concrete
Constr.	Construction
Cont	Continuous
Dia.	Diameter
Dim.	Dimension
Dwg.	Drawing
Elev.	Elevation
EQ	Equal Space
Ex. Or Exist.	Existing
Exp.	Expansion
F.V.	Field Verify
Ft	Foot or Feet
Ft²	Square Feet
Ft³	Cubic Feet
Ftg.	Footing
GC	General Contractor
Ga.	Gauge
Galv.	Galvanized
Hor.	Horizontal
H or Ht.	Height
Max.	Maximum
Min.	Minimum
Mtg.	Mounting
Mtl.	Metal
N/A	Not Applicable
Nom.	Nominal
O.C.	On Center
PSI	Per Square Inch
Reinf.	Reinforced
Req'd	Required
SF	Square Feet
SS	Stainless Steel
Sim	Similar
Spec	Specification
Sq	Square
Sq Ft	Square Feet
Std.	Standard
Stl	Steel
Struct.	Structural
TOW	Top of Wall
TYP	Typical
UON	Unless Otherwise Noted
UNO	Unless Noted Otherwise
Vert.	Vertical
W	Width
W/	With
WWF	Welded Wire Fabric
Wd.	Wood
Y³	Cubic Yards

SECTION 01 0000
GENERAL REQUIREMENTS

DIVISION 1 – GENERAL REQUIREMENTS

A. COMMUNICATIONS

1. General: Construction communications shall be made in writing. As a general rule, all communications shall be made through the architect and the architect will communicate construction directives and information only through the general contractor's designated representative for communications.
2. Email: Email may be utilized for time sensitive communications such as field reports, weather reports, RFI's, shop drawings, discoveries in the field, coordination of meeting schedules, construction conference reminders, changes in scheduled meetings, proposed changes etc. Emailed pay applications, insurance certificates, construction contracts, etc. will not be accepted.
3. North Carolina State Construction Office Document Repository: Certain documents transmitted for the purposes of administration are required to be entered into the internet-based NCSCO Interscope system. The Owner, Architect and Contractor are required to participate in this service.
   a. The Contractor shall obtain a Vendor Link registration to utilize the service.
   b. The Contractor shall review and approve material posted on Interscope as required.

B. OWNER OCCUPANCY

1. Allow the Owner occupancy and access to the facility by the public throughout the construction period. Repair damage caused by construction operations without additional cost to the Owner. Take all precautions necessary to protect the buildings, their occupants and their contents during the construction period.
2. Sequence, schedule and conduct construction and demolition operations to avoid disruption of the Owner's ongoing activities on the site.

C. USE OF PREMISES

Keep existing driveways and entrances serving the premises clear and available to the owner, his employees, and visitors at all times. Do not use these areas for parking or storage of materials.

D. SAMPLES

Samples of materials and equipment furnished for the Architect's review shall remain the Contractor's property and shall be removed by him after they have been reviewed or ceased to be useful.

E. COORDINATION

The Contractor, Subcontractors and material suppliers shall be responsible for inspecting all job conditions affecting the installation of an item and taking all field measurements required prior to fabrication of an item to insure that the item concerned will integrate properly with all adjacent materials and fit all other conditions as they exist or will exist in the finished construction. Work in connection with installation of an item shall be coordinated with all other affected work and trades.

F. SCHEDULE OF VALUES

The Contractor shall coordinate preparation of the Schedule of Values with preparation of the Construction Schedule.

Submit the Schedule of Values to the Architect at the earliest feasible date, but in no case later than 14 days before the date scheduled for submittal of initial Application for Payment.

Format and Content. Use the Project Manual Table of Contents as a guide to establish the format for the Schedule of Values.

Provide a detailed breakdown of the Contract Sum to facilitate continued evaluation of Applications for Payment and progress reports. Break subcontracts and work categories into line items to shop materials, equipment and labor costs. Arrange to facilitate payments to subcontractors.

Round amounts off to the nearest whole dollar. The total shall equal the Contract Sum.

Margins of Cost. Show line items for indirect costs, and margins on actual costs, only to the extent that such items will be listed individually in Applications for Payment. Each item in the Schedule of Values and Application of Payment shall be complete including its total cost and proportionate share of general overhead and profit margin.

At the Prime Contractor's option, temporary facilities and other major cost items that are not direct cost of actual work-in-place may be shown as separate line items in the Schedule of Values or distributed as general overhead expense.
Schedule Updating. When Change Orders or Construction Change Directives result in a change to the Contract Sum, add these to the Schedule of Values as a separate line item.

Approval. Schedule of Values shall be approved by the Owner.

G. CONSTRUCTION CONFERENCES

Prior to starting construction, a conference will be held at the site for the purpose of verifying general construction procedures and to establish a working understanding between all parties concerned. Present at the conference shall be a responsible representative of the Contractor, the job superintendent, State Construction monitor, and representatives of the Owner, Architect, and Engineers. The time of the conference shall be agreed upon by all parties.

Monthly construction conferences involving the same parties will be held at the site. A mutually agreeable time will be established for these meetings.

END OF SECTION

SECTION 01 2100
ALLOWANCES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Quantity allowances assigned to a unit price.

B. Stipulated sum allowances for brick veneer.

1.02 RELATED REQUIREMENTS

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

B. Section 01 2200 - Unit Prices for quantity allowances assigned to a unit price.

C. Section 31 2000 - Earth Moving.

1.03 SUMMARY

A. This Section includes administrative and procedural requirements governing Allowances. Selected materials are specified in the Contract Documents by allowances. In some cases, these allowances include installation. Allowances have been established in lieu of additional requirements and to defer selection of actual materials and equipment to a later date when additional information is available for evaluation.

1.04 SUBMITTALS

A. Submit proposals for purchase of products or systems included in allowances, in the form specified for Change Orders.

B. Submit invoices or delivery slips to show the actual quantities of materials delivered to the site for use in fulfillment of each allowance.

1.05 UNUSED MATERIALS

A. Return unused materials to the manufacturer or supplier for credit to the Owner, after installation has been completed and accepted.

1.06 ALLOWANCES SCHEDULE

A. Allowance 1: Section 31 2000 - Earth Moving: Quantity Allowance for undercut/disposal of unsuitable soils & select backfill (from off-site), Base Bid quantity = 50 CY. This allowance shall be based on the quantity here stated, as multiplied by the unit price included on the proposal form. Once the actual quantity is determined in the field, the unit price will be used to adjust the Contract Amount up or down, as required. See associated Unit Price 1.

B. Allowance 2: Section 04 2000 - Unit Masonry: Stipulated sum allowance for face brick as specified in Section 04 2000 and as shown on the drawing, delivered and unloaded at the site. Allow four hundred-fifty dollars ($450) per thousand. All other costs for labor and materials for installation of brick shall be included in the base bid.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 01 2200
UNIT PRICES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. List of unit prices, for use in preparing Bids.

1.02 RELATED REQUIREMENTS

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

B. Section 01 2100 Allowances for allowances assigned to a unit price.

C. Section 31 2000 - Earth Moving.

1.03 COSTS INCLUDED

A. Unit Prices included on the Bid Form shall include all necessary material, plus full compensation for all required labor, products, tools, equipment, plant, transportation, services and incidentals; erection, application or installation of an item of the Work; applicable taxes, insurance, overhead and profit.

1.04 UNIT QUANTITIES SPECIFIED

A. Quantities indicated in the Form of Proposal are for bidding and contract purposes only. Quantities and measurements of actual Work will determine the payment amount.

1.05 MEASUREMENT OF QUANTITIES

A. Take all measurements and compute quantities. Measurements and quantities will be verified by Architect.

B. Assist by providing necessary equipment, workers, and survey personnel as required.

C. Measurement by Area: Measured by square dimension using mean length and width or radius.

D. The Owner reserves the right to reject the Contractor's measurement of work-in-place that involves use of established unit prices, and to have this work measured, at the Owner's expense, by an independent surveyor acceptable to the Contractor.

1.06 PAYMENT

A. Payment for Work governed by unit prices will be made on the basis of the actual measurements and quantities of Work that is incorporated in or made necessary by the Work and accepted by the Architect, multiplied by the unit price.

B. Payment will not be made for any of the following:
   1. Products determined as unacceptable before or after placement.
   2. Products remaining on hand after completion of the Work.

1.07 SCHEDULE OF UNIT PRICES

A. Unit Price 1: Section 31 2000 - Earth Moving: Undercut/disposal of unsuitable soils and select backfill (from off-site), per Cubic Yard (CY). Base bid quantity per associated Allowance 1.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 01 2300
ALTERNATES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Description of alternates.

B. Procedures for pricing alternates.

1.02 RELATED REQUIREMENTS

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

B. Section 08 4500 - Translucent Wall Assemblies.

1.03 DEFINITIONS

A. Definition: An alternate is an amount proposed by bidders and stated on the Form of Proposal for certain work defined in the Bidding Requirements that may be added to or deducted from the Base Bid amount if the Owner decides to accept a corresponding change in either the amount of construction to be completed, or in the products, materials, equipment, systems, or installation methods described in the Contract Documents.

1. The cost or credit for each alternate is the net addition to, or deduction from the Contract Sum to incorporate the Alternate into the Work. No other adjustments are made to the Contract Sum.

1.04 ACCEPTANCE OF ALTERNATES

A. Alternates quoted on Bid Forms will be reviewed and accepted or rejected at Owner's option. Accepted alternates will be identified in the Owner-Contractor Agreement.

B. Coordinate related work and modify surrounding work to integrate the Work of each alternate.

C. Include as part of each alternate, miscellaneous devices, accessory objects, and similar items incidental to or required for a complete installation whether or not mentioned as part of the Alternate.

D. Notification: Immediately following the award of the Contract, notify each party involved, in writing, of the status of each alternate. Indicate whether alternates have been accepted, rejected, or deferred for later consideration. Include a complete description of negotiated modifications to alternates.

E. Execute accepted alternates under the same conditions as other Work of this Contract.

1.05 SCHEDULE OF ALTERNATES

A. Alternate No. 1 - Translucent Wall Panels:

1. Contractor shall provide a separate alternate price for furnishing and installation of translucent wall panels, in lieu of metal wall panels, as shown in the contract documents; see Specifications Section 08 4500.
2. Base bid includes metal wall panels over cold formed metal framing.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 01 7000
EXECUTION AND CLOSEOUT REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. General execution requirements and procedures.

B. Demonstration and instruction of Owner personnel.

C. Closeout procedures, except payment procedures.

1.02 RELATED REQUIREMENTS

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

B. Section 01 7800 - Closeout Submittals: Project record documents, operation and maintenance data, warranties and bonds.

1.03 PROJECT CONDITIONS

A. Use of explosives is not permitted.

B. Grade site to drain. Maintain excavations free of water. Provide, operate, and maintain pumping equipment.

C. Erosion and Sediment Control: Plan and execute work by methods to control surface drainage from cuts and fills, from borrow and waste disposal areas. Protect site from puddling or running water. Provide water barriers as required to protect site from soil erosion.
   1. Minimize amount of bare soil exposed at one time.
   2. Provide temporary measures such as berms, dikes, and drains, to prevent water flow.
   3. Construct fill and waste areas by selective placement to avoid erosive surface silts or clays.
   4. Periodically inspect earthwork to detect evidence of erosion and sedimentation; promptly apply corrective measures.

D. Ventilate enclosed areas to assist cure of materials, to dissipate humidity, and to prevent accumulation of dust, fumes, vapors, or gases.

E. Dust Control: Execute work by methods to minimize raising dust from construction operations. Provide positive means to prevent air-borne dust from dispersing into atmosphere and over adjacent property.

F. Pollution Control: Provide methods, means, and facilities to prevent contamination of soil, water, and atmosphere from discharge of noxious, toxic substances, and pollutants produced by construction operations. Comply with federal, state, and local regulations.

G. After Owner occupancy of premises, coordinate access to site for correction of defective work and work not in accordance with Contract Documents, to minimize disruption of Owner's activities.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.02 GENERAL INSTALLATION REQUIREMENTS

A. In addition to compliance with regulatory requirements, conduct construction operations in compliance with NFPA 241, including applicable recommendations in Appendix A.

B. Coordination of Work: Work in connection with installation of an item shall be coordinated with all other affected work and trades. Sleeves, anchors and other items that must be embodied

in or that otherwise affect other portions of the work shall be located and set while such portions of the work are in progress.

C. Install products as specified in individual sections, in accordance with manufacturer's instructions and recommendations, and so as to avoid waste due to necessity for replacement.

D. Anchor each product securely in place, accurately located and aligned with other Work.

E. Make vertical elements plumb and horizontal elements level, unless otherwise indicated.

F. Install equipment and fittings plumb and level, neatly aligned with adjacent vertical and horizontal lines, unless otherwise indicated.

G. Make consistent texture on surfaces, with seamless transitions, unless otherwise indicated.

H. Make neat transitions between different surfaces, maintaining texture and appearance.

I. Coordinate space requirements, supports, and installation of mechanical and electrical work that are indicated diagrammatically on Drawings. Follow routing shown for pipes, ducts, and conduit, as closely as practicable; place runs parallel with lines of building. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.

J. In finished areas except as otherwise indicated, conceal pipes, ducts, and wiring within the construction. Coordinate locations of fixtures and outlets with finish elements.

3.03 PROTECTION

A. General: The Contractor is responsible for the protection of his work until final acceptance of the work and shall take precautions to prevent damage to existing work and the work of subcontractors. It is the responsibility of the Contractor to repair, replace or restore his work to acceptable condition.

B. All materials and equipment delivered to job shall be handled, stored, and maintained in such manner as to thoroughly protect them from damage. The Contractor shall provide suitable storage for all materials subject to damage from exposure. All material shall be placed in orderly piles or stacks and shall not be so placed as to damage trees, shrubs, or other plants

C. Weather: Contractor shall bear full responsibility for damage caused by weather or storm to any part of the complete work and materials included in or forming part of this contract. He shall provide all protection, guards, braces, etc., required and shall make good in an approved manner at this own expense, any and all damage so caused.

D. Provide special protection where specified in individual specification sections.

E. Provide temporary and removable protection for installed products. Control activity in immediate work area to prevent damage.

F. Prohibit traffic from landscaped areas.

G. Remove protective coverings when no longer needed.

3.04 PROGRESS CLEANING

A. Maintain areas free of waste materials, debris, and rubbish. Maintain site in a clean and orderly condition.

B. Collect and remove waste materials, debris and trash from site periodically and dispose of off-site.

3.05 ADJUSTING

A. Adjust operating products and equipment to ensure smooth and unhindered operation.

3.06 DEMONSTRATION AND INSTRUCTION

A. Demonstrate operation and maintenance of products to Owner's personnel two weeks prior to date of final inspection.

B. Demonstrate start-up, operation, control, adjustment, trouble-shooting, servicing, maintenance, and shutdown of each item of equipment at scheduled time, at equipment location.

1. Arrange for each installer of equipment that requires regular maintenance to meet with the Owner's personnel to provide instruction in proper operation and maintenance. If installers are not experienced in procedures, provide instruction by manufacturer's representatives. Include a detailed review of the following items:
   a. Maintenance manuals.
   b. Record documents.
   c. Spare parts and materials.
   d. Tools.
   e. Lubricants.
   f. Fuels.
   g. Identification systems.
   h. Control sequences.
   i. Emergency instructions.
   j. Inspection procedures.
   k. Hazards.
   l. Cleaning.
   m. Warranties and bonds.
   n. Maintenance agreements and similar continuing commitments.
2. As part of instruction for operating equipment, demonstrate the following procedures:
   a. Start up.
   b. Shut down.
   c. Emergency operations.
   d. Noise and vibration adjustments.
   e. Safety procedures.
   f. Effective energy utilization, Economy and efficiency adjustments.

C. For equipment or systems requiring seasonal operation, perform demonstration for other season within six months.

D. Provide qualified persons who are knowledgeable about the equipment to perform demonstration and instruction of owner personnel.

E. Utilize operation and maintenance manuals as basis for instruction. Review contents of manual with Owner's personnel in detail to explain all aspects of operation and maintenance.

F. Prepare and insert additional data in operations and maintenance manuals when need for additional data becomes apparent during instruction.

3.07 FINAL CLEANING

A. Execute final cleaning before requesting inspection of Certification of Final completion.

B. Clean each surface or unit to the condition expected in a normal, commercial building cleaning and maintenance program in compliance with manufacturer's instructions.

C. Clean interior and exterior glass and mirrors. Restore reflective surfaces to their original reflective condition. Remove glazing compound and other substances that are vision-obscuring materials. Replace chipped or broken glass and other damaged transparent materials.

D. Clean interior and exterior surfaces exposed to view; remove stains and foreign substances, polish transparent and glossy surfaces. Clean exposed exterior and interior hard-surfaced finishes to a dust free condition, free of stains, films and similar foreign substances.

E. Leave concrete floors, not required to be waxed, vacuum clean. Vacuum all carpeted and soft surfaces. Wax tile, wood or other floors where a wax finish is applicable.

F. Remove all labels that are not permanent. Do not paint or otherwise cover fire test labels or nameplates on mechanical and electrical equipment.

G. Clean plumbing fixtures to a sanitary condition with cleaning materials appropriate to the surface and material being cleaned.

H. Wipe surfaces of mechanical and electrical equipment. Remove excess lubricant and other substances.

I. Replace or clean filters of operating equipment per the individual product specification section. Remove excess lubrication.

J. Clean lighting fixtures and lamps.

K. Clean debris from roofs, gutters, downspouts, and drainage systems.

L. Clean site of rubbish, litter and other foreign substances; sweep paved areas broom clean, rake clean landscaped surfaces. Remove stains, spills and other foreign deposits. Rake grounds that are neither paved nor planted, to a smooth even textured surface.

M. Remove waste, surplus materials, trash/rubbish, and construction facilities from the site; dispose of in legal manner; do not burn or bury. Contractor shall comply with regulations of authorities having jurisdiction and safety standard for cleaning. Do not discharge volatile, harmful or dangerous materials into drainage systems.

3.08 PRELIMINARY CLOSEOUT PROCEDURES

A. Before requesting inspection for Certification of Final Completion, each Prime Contractor shall complete the following. List exceptions in the request.
   1. Follow submittal procedures per Section 01 7800.
   2. Obtain releases enabling the Owner unrestricted use of the Work and access to services and utilities; include occupancy permits, operating certificates and other releases. Submit releases per Section 01 7800.
   3. Deliver tools, spare parts, extra stock, and similar items required in the specifications.
   4. Arrange for the disposition of extra materials of value which have become the Owner's property as directed by the Owner. Obtain Owner confirmation of receipt of materials and include confirmation with close-out materials.
   5. Make final change-over of permanent locks and transmit keys to the Owner. Obtain Owner confirmation of receipt of keys and include confirmation with close-out materials.
   6. Complete start-up testing of systems, and instruction of the Owner's operating and maintenance personnel.
   7. Complete final cleaning requirements above, including touch-up painting.
   8. Remove temporary protection and facilities installed for protection of the work during construction.

3.09 FINAL INSPECTION PROCEDURES

A. Submit written certification that Contract Documents have been reviewed, work has been inspected, and that work is complete in accordance with Contract Documents and ready for Architect's review.

B. The Architect will schedule a preliminary final inspection of the project for the purpose of developing a list of discrepancies (punch list) for the Contractor. A scheduled time for completion of the punch list items shall be established as required by contract. A copy of the punch list shall be sent to the State Construction Office prior to scheduling the final inspection.

C. Correct items of work listed in the punch list and comply with requirements for access to Owner-occupied areas.

D. Notify the Architect when work is considered finally complete, and all discrepancies noted in the punch list have been corrected. Submit a copy of the punch list, with each completed item initialed by the Contractor.

E. The Architect shall then verify the completeness of the project and schedule a formal final inspection with the contractor, owner and State Construction Office. The Architect shall furnish written notice of the inspection not less than seven (7) days prior to the inspection. The notice shall be sent to the Owner, the State Construction Office, the contractors concerned, the Insurance Department (Engineering Division), the Board of Health (Sanitary Engineering Division, where applicable), and regulatory agencies exercising jurisdiction on the project.

F. The Architect shall confirm in writing, the completion of all final punch list items by the Contractor.

3.10 FINAL ACCEPTANCE

A. Written approval from the State Construction office is required for final acceptance. Refer to General Conditions, Article 24, for requirements for partial occupancy.

B. Builders Risk Insurance: The contractors shall not cancel their builder's risk insurance until final acceptance of the project.

C. Final Documents: Refer to section 01 7800 Closeout Submittals for document submittal requirements.

END OF SECTION

CLOSEOUT SUBMITTALS - APPENDIX A

List of Warranties

The following is a list of sections containing requirements for warranties pertinent to this project. Refer to the individual specification sections for detailed warranty requirements. Specimen warranties are required with initial product submittals.

General Conditions of the Contract: General Contractor's 1-year warranty

Section 07 2500 Weather Barriers: Manufacturer's Warranty

Section 07 4113 Metal Roof Panels: Manufacturer's Warranty, Installer's Warranty

Section 07 4213 Metal Wall Panels: Installation Warranty, Finish Warranty

Section 07 9000 Joint Sealers: Manufacturer's Warranty

Section 08 3613 Sectional Doors: Manufacturer's Warranty

Section 08 4500 Translucent Wall and Roof Assemblies: Manufacturer's and Installer's Warranty

Section 08 7100 Door Hardware: Manufacturer's Warranties

Section 10 7300 Protective Covers: Manufacturer's Warranty

Division 22: Plumbing Subcontractor's Warranty

Division 23: Mechanical Subcontractor's Warranty

Division 26: Electrical Subcontractor's Warranty

BUNNELL-LAMMONS ENGINEERING, INC.
GEOTECHNICAL, ENVIRONMENTAL AND CONSTRUCTION MATERIALS CONSULTANTS

December 28, 2015

Mr. Arsalan Sabouri
CIP Projects Manager, Facilities Management Division
North Carolina Department of Transportation
1525 Mail Service Center
Raleigh, NC 27699-1525

Subject: **GEOTECHNICAL EXPLORATION REPORT**
Swain County Maintenance / New Storage Building
Bryson City, North Carolina
BLE Job No: J15-10305-01
BLE NC License No. C-1538

Dear Mr. Sabouri:

Bunnell-Lammons Engineering, Inc. (BLE) is pleased to present this report of geotechnical exploration for the above-referenced project. This report was performed in general accordance with Bunnell-Lammons Engineering (BLE) Proposal No. P15-0948 dated November 10, 2015 and authorized by a Notice To Proceed letter dated November 23, 2015 issued by Ms. Priscilla Tyree Williams, P.E., Director of the Facilities Management Division. The purpose of this exploration was to develop information about the site and subsurface soil conditions that could be used in design of the proposed structure at this site. Project information for this report was obtained from correspondence with you, along with a portion of an architectural site plan illustrating the location of the proposed building and suggested boring locations. Additional project information was obtained from a site visit performed by BLE during the course of the geotechnical exploration.

PROJECT INFORMATION

Current plans are to construct a storage building on the NCDOT Swain County Maintenance Yard in Bryson City, North Carolina. The storage building is proposed to be constructed on the east side of an existing maintenance building in an area currently occupied by maintained grass and a gravel parking area. The proposed structure will be one story in height and will have a footprint of approximately 3,500 square feet. Building construction is anticipated to consist of reinforced masonry with a concrete slab-on-grade. Shallow foundations are anticipated for support of the structure. Several entrances into the proposed building will be located on the west side of the structure.

Building loads were not available at the time this proposal was prepared, however, based on our experience with similar structures, we assume that the typical wall footing loads will not exceed 3 kips per lineal foot (klf). We also assume that no isolated columns are planned for the structure. Based on our review of the provided drawing, the slab-on-grade for the proposed building will have a finished floor elevation of approximately 1796± feet, which will require fills of up to 4 feet to establish the design subgrade elevation.

130 OVAL ROAD, SUITE 200
ARDEN, NORTH CAROLINA 28704

PHONE (828) 277-0100
FAX (828) 277-0110

We also understand based on our review of the provide drawing that the existing adjacent one story masonry maintenance building will be razed and that the former building footprint area will be raised by between 2 to 4 feet to achieve the proposed new site grades. We also understand that the proposed new building is not within the footprint of the building that is schedule to be razed.

FIELD EXPLORATION

The site was explored by performing the requested two (2) soil test borings at the approximate locations shown on the attached Boring Location Plan (reference Figure 1). The soil test borings were performed using a truck-mounted drill rig turning 2-1/4 inch I.D. hollow-stem augers. The soil test borings ranged in depth from 20 feet to 50 feet below the existing ground surface. Soil samples were obtained in accordance with ASTM D 1586 by driving a 1-3/8 inch I.D. split-spoon sampler with a 140-pound safety hammer. Boring locations were established in the field by referencing the provided drawing and the existing site features (building corners). The boring depths were developed by Bunnell-Lammons Engineering based on provided building data. The ground surface elevations at the boring locations were interpolated from the elevations contours shown on the provided drawing. As such, the boring locations and elevations referenced in this report and shown on the figures and field records should be considered approximate. The Soil Test Boring Records and a description of our field procedures are attached to this report.

Area Geology

The project site is located in the Blue Ridge Physiographic Province. The bedrock in this region is a complex crystalline formation that has been faulted and contorted by past tectonic movements. The rock has weathered to residual soils which form the mantle for the hillsides and hilltops. The typical residual soil profile in areas not disturbed by erosion or human activities consists of clayey soils near the surface where weathering is more advanced, underlain by sandy silts and silty sands.

The boundary between soil and rock is not sharply defined, and there often is a transitional zone, termed "partially weathered rock," overlying the parent bedrock. Partially weathered rock is defined, for engineering purposes, as residual material with standard penetration resistances in excess of 100 blows per foot (bpf). Weathering is facilitated by fractures, joints, and the presence of less resistant rock types. Consequently, the profile of the partially weathered rock and hard rock is quite irregular and erratic, even over short horizontal distances. Also, it is not unusual to find lenses and boulders of hard rock and/or zones of partially weathered rock within the soil mantle, well above the general bedrock level.

Site Conditions

Site conditions were observed by Mr. Sam C. Interlicchia during our site reconnaissance. The new storage building is proposed to be constructed at the existing NCDOT Maintenance Facility located off Toot Hollow Road in Bryson City, North Carolina. The new storage building is proposed to be located to the east of an existing maintenance building. The existing maintenance building is a single story building constructed of masonry with a concrete grade slab that appears to be supported on a conventional shallow foundation system. BLE did not enter the building or observe the building in detail due to the gate and building being locked at the time of our site visit; however, limited visual

observations of the masonry walls indicated that the masonry block wall was in fair condition. No indications of excessive settlement were apparent during our site visit; however, only the exterior east side of the structure was observed. Also, we have not been notified of any settlement related problems with the existing structure. The ground surface elevation within the proposed construction area is relative flat and typically ranges from 1792 feet to 1795 feet and is currently occupied by a maintained grass island and a gravel parking area. The existing gravel parking area was observed to be in fair condition, but was observed to have several potholes and rills. There were no visible rock outcroppings and no apparent groundwater springs observed during our site visit; however, we did observe ponded water in several of the drainage ditches around the site, along with a soggy subgrade. It is speculated that this condition is from the recent precipitation. Conditions differing from the above-described are plausible.

In addition, based on our review of publicly available aerial photography and a review of the provided drawing, we understand that Toot Hollow Branch is located along the western side of the NCDOT Facility. The branch has been piped in a 60 inch CMP and is located beneath a western most portion of the existing maintenance building, which is scheduled to be razed. BLE did not observe the branch or the CMP during our site visit.

Subsurface Conditions

In the area explored by borings, the surface condition consisted of crushed stone that varied in thickness from 3 to 4 inches. Beneath this surface material, the soil test borings encountered fill and residual soils.

Fill soils comprised of loose and firm silty sand was encountered at both boring locations to an approximate depth of 8.5 feet below the existing ground surface. No compaction testing data or field records of fill placement were available for our review at the time this report was prepared. Based on the standard penetration resistance data that ranged from 7 to 17 blows per foot, the existing fill generally appears to have received compactive effort during original placement. The fill was generally free of organics and deleterious materials, but was noted to be damp and wet. It should be noted that the content and quality of man-made fills can vary significantly.

Residual soil was encountered below the previously described fill soils. The residual soils predominantly consisted of loose to very firm silty sands. The residual soil was also noted to be wet in both borings. Standard penetration resistance values ranged from 10 to 25 blows per foot, typically becoming firmer with depth.

Groundwater was encountered by both borings at the time of drilling and when the borings were backfilled. The groundwater was encountered at depths of 6 feet to 7 feet below the existing ground surface. Because the borings were located in an area accessible by the public and for safety concerns, the borings were backfilled shortly after drilling thus precluding 24-hour ground water level measurements. Ground-water elevations at the site can be expected to fluctuate several feet with seasonal and climatic changes and with changes in Toot Hollow Branch. Ground water elevations may also fluctuate due to construction activity. Normally, the highest ground-water levels occur in late winter and spring and the lowest levels occur in late summer and fall.

The above descriptions provide a general summary of the subsurface conditions encountered. The appended test boring records contain detailed information recorded at each boring location. The boring logs represent our interpretation of the field logs based on engineering examination of the field samples. The lines designating the interfaces between various strata represent approximate boundaries and the transition between strata may be gradual. It should be noted that the soil conditions will vary between boring locations.

GEOTECHNICAL RECOMMENDATIONS

Based on the boring data collected to date, it is anticipated that site grading and foundation construction can generally be accomplished using conventional construction approaches and standard building practices. Shallow foundations appear to be a feasible approach to building support, provided all footings bear in approved existing fill, or in new, well-compacted fill. However, it is possible that these borings may not fully represent the conditions across the footprint. Since the site was previously developed, unexpected conditions, such as buried debris, loose/soft fill soils and/or abandoned utilities can be present between the boring locations. If soft, loose or unsuitable soil is encountered, undercutting of the existing soils would be required.

Foundations

Foundations bearing in approved existing fill, or in new well compacted fill placed on a suitable subgrade (constructed as recommended later in this report), may be sized for a uniform allowable bearing pressure of 2,500 psf subject to the criteria and site preparation recommendations in this report. In areas where foundations bear in pre-existing fill, select undercut and replacement may be required. The need for undercutting should be determined by a BLE representative at the time of construction, as discussed in detail below. Based on our evaluation using the assumed loads, footings proportioned as recommended in this report would be expected to exhibit total and differential settlements of 1 inch to ½-inch, respectively.

Our experience has been that soft or loose pockets of fill may be encountered at other locations where minimal compactive effort may have been used, particularly in landscaped areas. Occasionally, buried deleterious material could be encountered. The provided recommendations are contingent on a BLE representative observing that the soils encountered in footing excavations are consistent with the conditions encountered in our exploration. If deemed not suitable for the design bearing pressure, recommendations would then be made for any needed adjustments in foundation size or bearing elevation at specific locations. Recommendations would most likely include that the foundation excavation be undercut below the foundation bearing level and extended laterally beyond the foundation perimeter a distance equal to at least one-half the depth of undercut beneath the footing bearing level. The undercut excavation then would be backfilled with compacted engineered fill, crushed stone or lean (2,000 psi) concrete. We recommend that an allowance be budgeted to undercut some of the existing fill soils.

We recommend that the minimum widths for individual column and continuous wall footings be 24 and 18 inches, respectively. The minimum widths are considered advisable to provide a margin of safety against a local or punching shear failure of the foundation soils. Exterior/perimeter footings should bear at least 30 inches below final exterior grade for embedment needed to develop the recommended allowable design bearing pressure and to provide frost protection. Interior footings in heated spaces should bear at least 16 inches below the floor grade slab. The same protective embedment recommended for the interior and exterior spread footings should be used for the thickened perimeter and interior portions of a monolithic foundation slab, if such a slab is used in lieu of individual strip and spread footing foundations.

Exposure to the environment may weaken the soils at the footing bearing level if the foundation excavations remain open for long periods of time. Therefore, we recommend that, once each footing excavation is extended to final grade, the footing be constructed as soon as possible thereafter to minimize the potential for damage to the bearing soils. The foundation bearing area should be level or benched and free of loose soil, ponded water, and debris. Foundation concrete should not be placed on soils that have been softened. If the bearing soils are softened by surface water intrusion or exposure, the softened soils must be removed from the foundation excavation bottom prior to placement of concrete. If the excavation must remain open overnight or if rainfall becomes imminent while the bearing soils are exposed, we recommend placement of a 2 to 4-inch thick "mud-mat" of "lean" (2,000 psi) concrete on the bearing soils before the placement of reinforcing steel for protection against softening.

Grade Slab

Conventional grade slabs may be supported on properly compacted fill assuming that the site is prepared in accordance with the recommendations in this report. The top 16 inches of subgrade soil should be compacted to at least 98 percent of the standard Proctor (ASTM D 698) maximum dry density. It is recommended that the slab on grade be uniformly supported on a layer of aggregate base coarse, as specified in the North Carolina Department of Transportation Standard Specifications for Roads and Structures, 2012 Edition. The aggregate base coarse layer should have a minimum thickness of 6 inches and be compacted to at least 98 percent of its standard Proctor compaction test. Based on previous experience with similar soils, a maximum modulus of subgrade reaction (k) equal to 110 pounds per cubic inch should be used for design of slabs on properly prepared subgrades supported by an adequate depth of base coarse. Completed slabs should be protected from excessive surface moisture prior to and during periods of prolonged below-freezing temperatures to prevent subgrade freezing and resulting heave.

Seismic Site Classification

Based on the definitions provided in the 2012 North Carolina Building Code, which references the 2009 International Building Code and the soil boring data, we recommend the structure be designed using a seismic Site Class D.

GENERAL GRADING RECOMMENDATIONS

Site Preparation

Site preparation should include the removal of all unsuitable surface materials (surface debris, surface vegetation, topsoil, and root systems) and disposed of offsite. Topsoil and organic soils may be stockpiled for later use in areas to be landscaped. All existing abandoned utilities should be removed and replaced with engineered fill or plugged prior to construction. If pipes are not removed or plugged, they may serve as conduits for subsurface erosion resulting in settlements or sinkholes. Foundation bearing levels should be set to avoid affecting foundation support by the presence of utilities and their backfill. BLE should be consulted with when underground utilities or below grade structures are encountered. The surface should be kept smooth and sloped to provide positive drainage and surface water runoff should be routed to ditches adjacent to the work area. The razing of the existing maintenance building should include the removal of all of the grade slab and shallow foundation system. During razing of the building care should be taken to not disturb or damage the existing 60 inch CMP. If damaged, the pipe should be repaired before placement of the overlying fill soil.

Following site stripping, the surface soils will be prone to soften when exposed to rainfall. The surface should be kept smooth and sloped to provide positive drainage and surface water runoff should be routed to ditches adjacent to the work area.

Proofrolling

After stripping, we recommend that areas to provide support for the foundations, floor slab, engineered fill and pavement be carefully inspected for soft surficial soils and proofrolled with a 25 to 35 ton, four-wheeled, rubber-tired roller or similar approved equipment. The proofroller should make at least four passes over each location, with the last two passes perpendicular to the first two where practical. Any areas which wave, rut, or deflect excessively and continue to do so after several passes of the proofroller should be excavated to firmer soils. The excavated areas should be backfilled in thin lifts with engineered fill. The proofrolling and excavating operations should be carefully monitored by an experienced engineering technician working under the direction of the geotechnical engineer. Proofrolling should not be performed when the ground is frozen or wet from recent precipitation.

The stability of the subgrade will vary across the site and the effort required to prepare the subgrade for fill placement will largely depend on prevailing weather conditions at the time of construction with the potential for some areas to be soft and unstable under wheel loads. Areas where unstable subgrade material is encountered should be stabilize before commence of the overlying fill soil. We anticipate that subgrade stability can typically be achieved by undercutting portion of the unsuitable soils (the depth of undercutting should be determined in the field by BLE at the time of construction) and backfilling with properly compacted new fill. A heavy woven geotextile or biaxial geogrid may also be required along with the use of crushed rock to provide a suitable subgrade.

Excavation and Groundwater Management

Confined excavations such as for utility installation or below-grade construction should conform to OSHA regulations. All excavations should be sloped or shored in accordance with local, state, and federal regulations, including OSHA (29 CFR Part 1926) excavation trench safety standards. The contractor is solely responsible for site safety.

Based on our understanding of the project, the site will receive up to 4 feet of new compacted fill. Based on this information, the current ground water elevation is not within the expected construction depths. The contractor should be prepared to promptly remove any surface water or ground water (if encountered) from the construction area. This has been done effectively on past jobs by means of gravity ditches and pumping from filtered sumps. Additionally, it is important to realize that ground water levels will fluctuate and could occur at higher elevations or be perched.

Engineered Fill

All fill used for raising site grade or for replacement of material that is undercut should be uniformly compacted in thin lifts to at least 95 percent of the standard Proctor maximum dry density (ASTM D 698). Beneath floor slabs and parking areas, the compaction requirement should be raised to 98 percent in the upper 16 inches. The soils to be used in the engineered fill should contain no more than 3 percent organic matter by weight and should be free of roots, limbs, other deleterious material and rocks larger than 6-inches in diameter. In addition, the moisture content of the compacted soil fill should be maintained within plus or minus 3 percent of the optimum moisture content as determined from the standard proctor compaction test during placement and compaction. This provision may require the contractor to dry soils during periods of wet weather or to wet soils during dry periods. The fill soils should have a Plasticity Index (PI) of less than 30, and a maximum dry density of no less than 90 pounds per cubic foot (pcf).

Before filling operations begin, representative samples of each proposed fill material should be collected and tested to determine the compaction and classification characteristics. The maximum dry density and optimum moisture content should be determined. Once compaction begins, a sufficient number of density tests should be performed by an experienced engineering technician working under the direction of the BLE geotechnical engineer to measure the degree of compaction being obtained.

The surface of compacted subgrade soils can deteriorate and lose its support capabilities when exposed to environmental changes and construction activity. Deterioration can occur in the form of freezing, formation of erosion gullies, extreme drying, exposure for a long period of time or rutting by construction traffic. We recommend that the surfaces of floor slab subgrades that have deteriorated or softened be recompacted prior to construction of the floor slab. Additionally, any excavations through the subgrade soils (such as utility trenches) should be properly backfilled in compacted lifts. Recompaction of subgrade surfaces and compaction of backfill should be checked with a sufficient number of density tests to determine if adequate compaction is being achieved.

SECONDARY CONSIDERATIONS

The following items are presented for your consideration. These items are known to generally enhance performance of structural systems.

- Roof drainage should be collected by a system of gutters and downspouts and directed away from all structure.
- Sidewalks and paved areas should be sloped so that water drains away from the structure.
- Site grading should result in positive drainage away from the structure. Water should not be allowed to pond around the structure or in such locations that would lead to saturation of subgrade materials. A minimum slope of approximately ¼ to ½-inch per foot should provide adequate drainage.
- Backfill for utility lines should be placed in accordance with the requirements for engineered fill to minimize the potential for differential settlement.

SPECIFICATION REVIEW

It is recommended that Bunnell-Lammons Engineering be provided the opportunity to make a general review of the foundation and earthwork plans and specifications prepared from the recommendations presented in this report. We would then suggest any modifications so that our recommendations are properly interpreted and implemented.

BASIS OF RECOMMENDATIONS

Our geotechnical evaluation has been based on our understanding of the project information and data obtained in our exploration as well as our experience on similar projects. The general subsurface conditions utilized in our foundation evaluation have been based on interpolation of the subsurface data between the borings. Subsurface conditions between the borings may differ. If the project information is incorrect or the structure location (horizontal or vertical) and/or dimensions are changed, please contact us so that our recommendations can be reviewed. The discovery of any site or subsurface conditions during construction which deviate from the data obtained in this exploration should be reported to us for our evaluation. The assessment of site environmental conditions for presence of pollutants in the soil, rock and groundwater of the site was beyond the scope of this exploration. We also suggest that after our report has been reviewed, a meeting be held with the designers, contractors and our firm to ascertain whether we have interpreted the building design correctly and that our recommendations are understood.

CLOSING

We appreciate the opportunity to provide our professional geotechnical services on this project. We look forward to providing construction materials and technician field testing services as the project progresses. If you have any questions regarding this report please to not hesitate to call us.

Sincerely,
BUNNELL-LAMMONS ENGINEERING, INC.

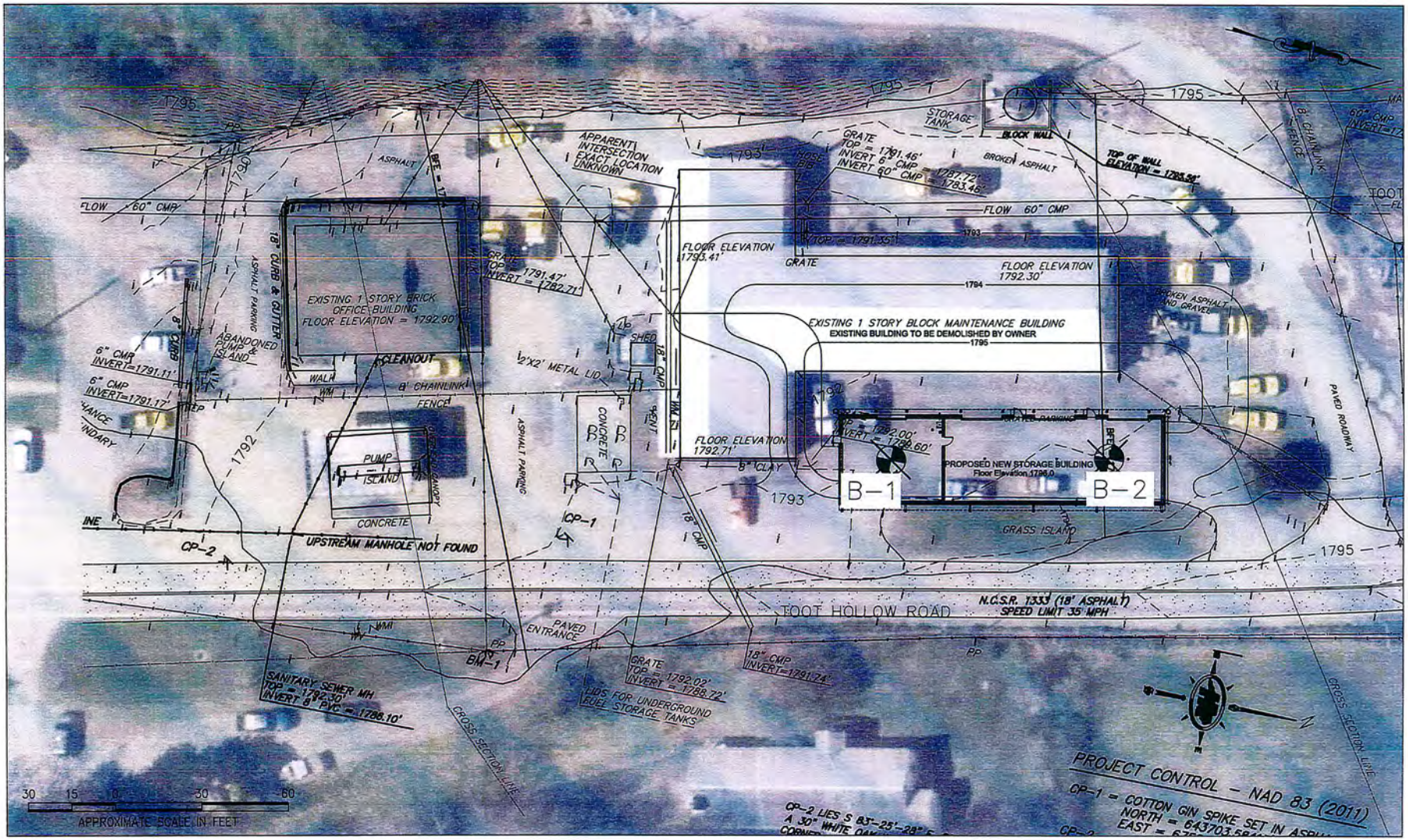
Sam C. Interlicchia
Project Manager

Jesse R. Jacobson, P.E.
Asheville Branch Manager
North Carolina Registered 030948

NORTH CAROLINA PROFESSIONAL SEAL 030948 ENGINEER JESSE R. JACOBSON 12/28/15

Attachments:

Boring Location Plan
Soil Test Boring Records
Key to Soil Symbols and Classifications
Field Exploration Procedures



DRAWN BY: JWB	DATE: 12-28-2015	REVISIONS			BUNNELL-LAMMONS ENGINEERING, INC.	BORING LOCATION PLAN COUNTY MAINTENANCE OFFICE SWAIN COUNTY, NORTH CAROLINA	FIGURE
CHECKED BY: SCI	FILE: Borings Swain County	No.	DESCRIPTION	BY	BLE INC.		1
APPROVED BY:	JOB NO: J15-10304-01				130 OVAL ROAD, SUITE 200 ARDEN, NORTH CAROLINA 28704 PHONE: (828)277-0100 FAX: (828)277-0110		

BLE INC.

BUNNELL-LAMMONS ENGINEERING, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

SOIL BORING NO. B-1

PROJECT: Swain Co. NCDOT Maintenance Shed
PROJECT NO.: J15-10305-01
CLIENT: NCDOT
START: 12/16/15 END: 12/16/15
LOCATION: Swain County
ELEVATION: 1793
DRILLER: METRO DRILL, INC., Bill/Levi
LOGGED BY: S. Interlicchia
DRILLING METHOD: Acker Soil Sentry, 2 1/4" Hollow Stem Auger
DEPTH TO - WATER> INITIAL: ▽ 6 AFTER 24 HOURS: ▼ CAVING>

ELEVATION/ DEPTH (FT)	SOIL DESCRIPTION	SOIL TYPE	SAMPLES	STANDARD PENETRATION RESULTS BLOWS/FOOT (2 5 10 20 30 40 50 70 90)
1790 / 0	3 inches crushed STONE			
	Firm, damp, reddish brown, slightly clayey, silty fine to medium SAND (SM) - (fill)			5 7 9
	Loose, wet, reddish brown tan, silty fine to medium SAND (SM)			3 3 4
5				3 4 5
	Loose to firm, wet, tan brown, slightly micaceous, silty fine to medium SAND (SM) - (residuum)			4 9 6
1780 / 10				4 5 6
15				5 6 8
1770 / 20	Boring terminated at 20 feet. Groundwater encountered at 6 feet at time of drilling and backfilling.			
25				
1760 / 30				
35				
1750 / 40				
45				
1740 / 50				

GEOT_NOWELL 10305-01.GPJ 12/28/15

BLB INC.

BUNNELL-LAMMONS ENGINEERING, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

SOIL BORING NO. B-2

PROJECT: Swain Co. NCDOT Maintenance Shed
PROJECT NO.: J15-10305-01
CLIENT: NCDOT
START: 12/16/15 END: 12/16/15
LOCATION: Swain County
ELEVATION: 1793
DRILLER: METRO DRILL, INC., Bill/Levi
LOGGED BY: S. Interlicchia
DRILLING METHOD: Acker Soil Sentry, 2 1/4" Hollow Stem Auger
DEPTH TO - WATER> INITIAL: ▽ 7 AFTER 24 HOURS: ▼ CAVING>

ELEVATION/ DEPTH (FT)	SOIL DESCRIPTION	SOIL TYPE	SAMPLES	STANDARD PENETRATION RESULTS BLOWS/FOOT (2 5 10 20 30 40 50 70 90)
1790 / 0	4 inches crushed STONE			
	Firm, damp, reddsih gray brown, slightly clayey, silty fine to medium SAND (SM) - (residuum)			6 7 10
5				5 5 6
				7 9 12
	Firm and very firm, wet, reddish brown, silty fine to medium SAND (SM) - (residuum)			8 12 14
1780 / 10				8 8 10
15				7 9 12
1770 / 20				
	Very firm, wet, tan brown, slightly micaceous, silty fine to medium SAND (SM)			8 10 13
25				9 9 11
1760 / 30				10 11 13
35				
	Very firm, wet, dark gray, micaceous, silty fine to medium SAND (SM)			12 14 11
1750 / 40				10 11 13
45				9 12 14
1740 / 50	Boring terminated at 50 feet. Groundwater encountered at 7 feet at time of drilling.			

GEOT_NOWELL 10305-01.GPJ 12/28/15

KEY TO SOIL CLASSIFICATIONS AND CONSISTENCY DESCRIPTIONS

BUNNELL-LAMMONS ENGINEERING, INC.
ASHEVILLE, NORTH CAROLINA

Penetration Resistance* Blows per Foot	Relative Density
SANDS	
0 to 4	Very Loose
5 to 10	Loose
11 to 20	Firm
21 to 30	Very Firm
31 to 50	Dense
over 50	Very Dense

Penetration Resistance* Blows per Foot	Consistency
SILTS and CLAYS	
0 to 2	Very Soft
3 to 4	Soft
5 to 8	Firm
9 to 15	Stiff
16 to 30	Very Stiff
31 to 50	Hard
over 50	Very Hard

*ASTM D 1586

Particle Size Identification

Boulder: Greater than 300 mm
Cobble: 75 to 300 mm
Gravel:
Coarse - 19 to 75 mm
Fine - 4.75 to 19 mm
Sand:
Coarse - 2 to 4.75 mm
Medium - 0.425 to 2 mm
Fine - 0.075 to 0.425 mm
Silt & Clay: Less than 0.075 mm

12	Number of blows in first 6-inches
15	Number of blows in second 6-inches
16	Number of blows in third 6-inches

KEY TO DRILLING SYMBOLS


Grab Sample


Split Spoon Sample


Undistrurbed Sample


Groundwater Table at Time of Drilling


Groundwater Table 24 Hours after Completion of Drilling

KEY TO SOIL CLASSIFICATIONS


Well-graded Gravel
GW


Low Plasticity Clay
CL


Clayey Silt
MH


Silty Sand
SM

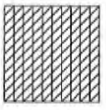

Poorly-graded Gravel
GP

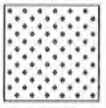

Sandy Clay
CLS


Sandy Silt
MLS


Topsoil
TOPSOIL


Partially Weathered Rock
BLDRCBBL


Silty Clay
CL-ML


Sand
SW


Bedrock
BEDROCK


High Plasticity Clay
CH


Silt
ML


Clayey Sand
SC


Concrete
A5

Field Exploration Procedures

SOIL TEST BORINGS

The borings were made by mechanically twisting a continuous flight steel auger into the soil. Soil sampling and penetration testing were performed in accordance with ASTM D-1586. At assigned intervals, soil samples were obtained with a standard 1.4-inch I.D., 2-inch O.D., split-tube sampler. The sampler was first seated 6 inches to penetrate any loose cuttings, and then driven an additional 12 inches with blows of a 140-pound hammer falling 30 inches. The number of hammer blows required to drive the sampler the final 12 inches was recorded and is designated the "standard penetration resistance." The penetration resistance, once properly evaluated, is an index to the strength of the soil and foundation supporting capability. Representative portions of the soil samples, thus obtained, were placed in glass jars and transported to the laboratory. In the laboratory, the samples were examined by a geotechnical engineer and visually classified. Soil Test Boring Records are attached showing the soil descriptions and penetration resistance.

SECTION 03 3000
CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.01 SUMMARY

A. This section specifies cast-in-place concrete, including formwork, reinforcing, mix design, placement procedures and finishes, curing and testing.

B. Cast-in-Place Concrete includes the following:
   1. Concrete footings and foundations.
   2. Floors and slabs on grade.
   3. Joint devices associated with concrete work.
   4. Miscellaneous concrete elements, including equipment pads, light pole bases, flagpole bases, thrust blocks, and manholes.

1.02 RELATED REQUIREMENTS

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

B. Section 01 7800 - Closeout Submittals.

C. Section 07 9000 - Joint Sealers: Sealants for saw cut joints and isolation joints in slabs.

D. Section 32 1313 - Concrete Paving: Sidewalks, curbs and gutters.

1.03 SUBMITTALS

A. See General and Supplementary General Conditions for submittal procedures.

B. Qualification Data: Indicating compliance with Quality Assurance Article.

C. Product Data: Submit manufacturers' data on manufactured products showing compliance with specified requirements. Products include reinforcement and forming accessories, admixtures, patching compounds, waterstops, joint systems, curing compounds, dry-shake finish materials, and others if requested by Architect.

D. Shop drawings for reinforcement detailing, fabricating, bending, and placing concrete reinforcement. Comply with ACI 315 "Manual of Standard Practice for Detailing Reinforced Concrete Structures" showing bar schedules, stirrup spacing, bent bar diagrams, and arrangement of concrete reinforcement. Include special reinforcing required for openings through concrete structures.

E. Laboratory test reports for concrete materials and mix design test.

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

1.04 QUALITY ASSURANCE

A. Perform work of this section in accordance with provisions of the following codes, specifications and standards, except where more stringent requirements are shown or specified.
   1. ACI 301 “Specifications for Structural Concrete for Buildings”.
   2. ACI 318 “Building Code Requirements for Structural Concrete and Commentary”.
   3. CRSI “Manual of Standard Practice.”

B. Follow recommendations of ACI 305R when concreting during hot weather. Calcium Chloride will not be used.

C. Follow recommendations of ACI 306R when concreting during cold weather. Calcium Chloride will not be used.

D. Batching and mixing of concrete shall comply with ASTM C94.

E. Concrete Testing Service: The General Contractor shall utilize the concrete testing service employed by the Owner.

F. Materials and installed work may require testing and retesting at any time during the progress of the Work. Retesting of rejected materials for installed Work shall be done at Contractor's expense.

PART 2 - PRODUCTS

2.01 FORMWORK

A. Formwork Design and Construction: Comply with guidelines of ACI 347 to provide formwork that will produce concrete complying with tolerances of ACI 117.

B. Form Materials: Contractor's choice of standard products with sufficient strength to withstand hydrostatic head without distortion in excess of permitted tolerances.
   1. Form Facing for Exposed Finish Concrete: Steel, preformed plastic, fiberglass, or MDO plywood. Contractor's choice of materials that will provide smooth, stain-free final appearance.
   2. Form Coating: Release agent that will not adversely affect concrete or interfere with application of coatings.
   3. Form Ties: Cone snap type that will leave no metal within 1-1/2 inches of concrete surface. Provide ties that, when removed, will leave holes not larger than 1 inch in diameter in the concrete surface.

2.02 REINFORCEMENT

A. Reinforcing Steel: ASTM A 615/A 615M Grade 60.
   1. Type: Deformed.
   2. Finish: Unfinished, unless otherwise indicated.

B. Steel Welded Wire Reinforcement: ASTM A 185, Galvanized.
   1. Form: Flat Sheets.
   2. Mesh Size and Wire Gage: As indicated on drawings.

C. Reinforcement Accessories:
   1. Tie Wire: Annealed, minimum 16 gage.
   2. Chairs, Bolsters, Bar Supports, Spacers: Sized and shaped for adequate support of reinforcement during concrete placement. Comply with CRSI specifications.
      a. For slabs-on-grade, use supports with sand plates or horizontal runners where base material will not support chair legs.
   3. Provide stainless steel, galvanized, or plastic components for placement within 1-1/2 inches of weathering surfaces. Comply with CRSE specifications for plastic (Class 1) or stainless steel (Class 2).

2.03 CONCRETE MATERIALS

A. Cement: ASTM C 150,Type I - Normal Portland type.
   1. Acquire all cement for entire project from same source.

B. Normal Weight Aggregates, Fine and Coarse Aggregates: ASTM C 33.
   1. Acquire all aggregates for entire project from same source.
   2. Local aggregates not complying with ASTM C 33 that have been shown to produce concrete of adequate strength and durability by special tests or actual service may be used when acceptable to Architect.
   3. Maximum aggregate size: 3/4 inch.

C. Lightweight Aggregate: ASTM C 330.

D. Fly Ash: ASTM C618, Class F. Loss on ignition shall be less than 3% and all fly ash shall be a classified process material. Fly ash shall be obtained from one source for the entire project and for all concrete delivered to the project. Complete chemical and physical analysis of the fly ash shall be submitted to the Engineer prior to use, and the reports of chemical and physical

tests on all shipments to the supplier shall be maintained by the supplier for the duration of the project. The amount of fly ash in concrete mixes prepared with fly ash shall not be less than fifteen percent (15%) nor more than twenty five percent (25%) by weight of cement.

E. Calcined Pozzolan: ASTM C 618, Class N.

F. Silica Fume: ASTM C 1240, proportioned in accordance with ACI 211.1.

G. Water: Potable

2.04 CHEMICAL ADMIXTURES

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

B. Air Entrainment Admixture: ASTM C 260.
   1. Acceptable Products: Subject to compliance with requirements, products that may be incorporated in the Work include, but are not limited to, the following:
      a. Air-Mix or Perma-Air, Euclid Chemical Co.
      b. Darex AEA or Daravair, W.R. Grace & Co.
      c. MasterAir VR 10 or MasterAir AE 200, Master Builders Solutions, Inc., BASF
      d. Substitutions: See General Conditions.

C. High Range Water Reducing Admixture: ASTM C 494/C 494M Type F.
   1. Acceptable Products: Subject to compliance with requirements, products that may be incorporated in the Work include, but are not limited to, the following:
      a. Eucon 37, Euclid Chemical Co.
      b. WRDA 19 or Daracem, W.R. Grace & Co.
      c. MasterRheobuild 1000, Master Builders Solutions, Inc., BASF.
      d. Substitutions: See General Conditions.

D. Mid Range Water Reducing Admixture: ASTM C 494/C 494M Type F.

E. Water Reducing Admixture: ASTM C 494 Type A.
   1. Acceptable Products: Subject to compliance with requirements, products that may be incorporated in the Work include, but are not limited to, the following:
      a. Eucon WR-75, Euclid Chemical Co.
      b. WRDA, W.R. Grace & Co.
      c. MasterPozzolith or MasterPolyheed, Master Builders Solutions, Inc., BASF.
      d. Substitutions: See General Conditions.

2.05 ACCESSORY MATERIALS

A. Vapor Barrier: ASTM E 1745 Class A. Water-resistant barrier consisting of multilayer extrusion manufactured from polyolefin resins, stated by manufacturer as suitable for installation in contact with soil or granular fill under concrete slabs.
   1. Puncture Resistance: Minimum 2200 grams when tested per ASTM D 1709.
   2. Water Vapor Permeance: Maximum .03 perms when tested per ASTM E 154.
   3. Acceptable Products: Subject to compliance with requirements, products that may be incorporated in the Work include, but are not limited to, the following:
      a. Moistop Ultra 10, Fortifiber Building Systems Group.
      b. Viper Vaporcheck II, Insulation Solutions.
      c. Stego Wrap 10 mil, Stego Industries.
      d. Vapor Block 10, Raven Industries.
      e. Substitutions: See General Conditions.

B. Gravel Base: Clean, crushed granite stone, maximum size 3/4".

C. Chemical Hardener: Fluosilicate solution designed for densification of cured concrete slabs.

D. Non-Shrink Cementitious Grout: ASTM C 1107/C 1107M; premixed compound consisting of non-metallic aggregate, cement, water reducing and plasticizing agents.
   1. Acceptable Products: Subject to compliance with requirements, products that may be incorporated in the Work include, but are not limited to, the following:

a. Euco N.S.; Euclid Chemical Co.
b. Crystex; L & M Construction Chemicals, Inc.
c. MasterFlow 928; Master Builders Solutions, Inc., BASF.
d. Five Star Grout; U.S. Grout Corp.
e. Substitutions: See General Conditions.

E. Erosion Resistant Anchoring Cement: Rapid-setting pourable, portland cement based grout.
1. Acceptable Products: Subject to compliance with requirements, products that may be incorporated in the Work include, but are not limited to, the following:
a. ProSpec, W.R. Bonsal Co.
b. Super Por-Rok, Minwax Construction Products Division.
c. Thorogrip, Thoro Systems Products.
d. Substitutions: See General Conditions.

2.06 BONDING AND JOINTING PRODUCTS

A. Latex Bonding Agent: Non-dispersible acrylic latex, complying with ASTM C 1059 Type II. Subject to compliance with requirements, products that may be incorporated in the Work include, but are not limited to, the following:
1. Polyvinyl Acetate (Interior Only):
a. Euco Weld, Euclid Chemical Co.
b. Weld-Crete, Larsen Products Corps.
c. Everweld, L & M Construction Chemicals, Inc.
2. Acrylic or Styrene Butadiene:
a. SBR Latex, Euclid Chemical Co.
b. Daraweld C, W.R. Grace & Co.
3. Substitutions: See General Conditions.

B. Epoxy Bonding System: Complying with ASTM C 881 and of Type required for specific application.
1. Acceptable Products: Subject to compliance with requirements, products that may be incorporated in the Work include, but are not limited to, the following
a. Euco Epoxy System #452 or #620, Euclid Chemical Co.
b. MasterEmaco ADH 326, Master Builders Solutions, Inc., BASF.
c. Rezi-Weld 1000, W.R. Meadows, Inc. .
d. Substitutions: See General Conditions.

C. Slab Isolation Joint Filler: 1/2 inch thick, height equal to slab thickness, with removable top section that will form 1/2 inch deep sealant pocket after removal.

D. Joint Filler: Nonextruding, resilient asphalt impregnated fiberboard, felt, or cork complying with ASTM D 1751, full depth of slab less 1/2 inch.

E. Sealant and Primer: As specified in Section 07 9000.

2.07 CURING MATERIALS

A. General: Provide curing agent that will not adversely affect concrete or interfere with application of coatings.

B. Evaporation Control: Monomolecular film-forming compound applied to concrete surfaces for temporary protection from rapid moisture loss. Subject to compliance with requirements, products that may be incorporated in the Work include, but are not limited to, the following:
1. Available Products: Subject to compliance with requirements, products that may be incorporated in the Work include, but are not limited to, the following:
a. Eucobar, Euclid Chemical Co.
b. E-Con, L&M Construction Chemicals, Inc.
c. MasterKure ER 50, Master Builders Solutions, Inc., BASF.
d. Substitutions: See General Conditions.

C. Liquid Membrane-Forming Curing Compound: ASTM C 309, Class A, for exterior use. Moisture loss not more than 0.55 kg/sq. meter when applied at 200 Sq. Ft./gal.
   1. Available Products: Subject to compliance with requirements, products that may be incorporated in the Work include, but are not limited to, the following:
      a. Pro-Cure, Atlas Construction Supply.
      b. Eucocure, Euclid Chemical Co.
      c. CS-309, W.R. Meadows, Inc.
      d. Substitutions: See General Conditions.

D. Moisture-Retaining Cover: ASTM C 171.
   1. Acceptable Products, Subject to compliance with requirements, products that may be incorporated in the Work include, but are not limited to, the following:
      a. Waterproof Paper.
      b. Polyethylene film.
      c. Polyethylene-coated burlap.

E. Absorptive Cover: Burlap cloth made from jute or kenaf, weighing approximately 9 oz. per sq. yd., complying with AASHTO M 182, Class 2.

2.08 CONCRETE MIX DESIGN

A. Prepare design mixes for each type and strength of concrete indicated on the drawings by either laboratory trial batch or field experience methods as specified in ACI 301 and ACI 318. For the trial batch method, use an independent testing agency acceptable to Architect for preparing and reporting proposed mix designs. Do not use the same testing agency for field quality control testing.

B. Submit written reports to Architect of each proposed mix for each class of concrete at least 15 days prior to start of Work. Do not begin concrete production until proposed mix designs have been reviewed by Architect.

C. Design mixes to provide normal weight concrete with the following properties as indicated on drawings and schedules:
   1. Exterior Concrete - 4000-psi, 28-day compressive strength; water-cement ratio, 0.45 maximum (air-entrained, no fly ash).
   2. Interior Concrete - 3000-psi, 28-day compressive strength; water-cement ratio, 0.58 maximum (non-air-entrained), 0.46 maximum (air-entrained).

D. Water-Cement Ratio: Provide concrete for following conditions with maximum water-cement (W/C) ratios as follows:
   1. Subjected to freezing and thawing: W/C 0.45.
   2. Subjected to deicers: W/C 0.45

E. Slump Limits: Proportion and design mixes for concrete slump at point of placement of 3 to 5-1/2" (8" min. for exterior concrete containing high-range water reducing admixture (superplasticizer).

F. Adjustment to Concrete Mixes: Mix design adjustments may be requested by Contractor when characteristics of materials, job conditions, weather, test results, or other circumstances warrant, as accepted by Architect. Laboratory test data for revised mix design and strength results must be submitted to and accepted by Architect before using in Work.

2.09 ADMIXTURES

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

B. Use high-range water-reducing admixture in pumped concrete, concrete for heavy-use industrial slabs, architectural concrete, parking structure slabs, concrete required to be watertight, and concrete with water-cement ratios below 0.50.

C. Use air-entraining admixture in exterior exposed concrete unless otherwise indicated. Add admixture at manufacturer's prescribed rate to result in concrete at point of placement having total air content with a tolerance of plus or minus 1-1/2 percent within the following limits:

1. Concrete structures and slabs exposed to freezing and thawing, deicer chemicals, or hydraulic pressure: 6.0 percent (severe exposure) for 3/4-inch maximum aggregate.
2. Other concrete not exposed to freezing, thawing, or hydraulic pressure, or to receive a surface hardener: 2 to 4 percent air.

2.10 CONCRETE MIXING

A. Ready-Mixed Concrete: comply with requirements of ASTM C 94, and as specified. When air temperature is between 85º F and 90º F, reduce mixing and delivery time from 1-1/2 hours to 75 minutes, and when air temperature is above 90º F, reduce mixing and delivery time to 60 minutes.

PART 3 - EXECUTION

3.01 EXAMINATION

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

B. Coordinate the installation of related materials with placement of forms and reinforcing steel.

3.02 PREPARATION

A. Formwork General: Design, erect, support, brace, and maintain formwork to support vertical, lateral, static, and dynamic loads that might be applied until concrete structure can support such loads. Construct formwork so concrete members and structures are of correct size, shape, alignment, elevation, and position. Maintain formwork construction tolerances and surface irregularities complying with the following ACI 347 limits:
   1. Provide Class A tolerances for concrete surfaces exposed to view.
   2. Provide Class C tolerances for other concrete surfaces.

B. Construct forms to sizes, shapes, lines, and dimensions shown and to obtain accurate alignment, location, grades, level, and plumb work in finished structures. Provide for openings, offsets, sinkages, keyways, recesses, moldings, rustications, reglets, chamfers, blocking, screeds, bulkheads, anchorages and inserts, and other features required in the Work. Use selected materials to obtain required finishes. Solidly butt joints and provide backup at joints to prevent cement paste from leaking.

C. 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, etc. for easy removal.

D. Forms for Slabs: Set edge forms, bulkheads, and intermediate screed strips for slabs to achieve required elevations and contours in finished surfaces. Provide and secure units to support screed strips using strike-off templates or compacting-type screeds.

E. Provide temporary openings for clean-outs and inspections where interior area of formwork is inaccessible before and during concrete placement. Securely brace temporary openings and set tightly to forms to prevent losing concrete mortar. Locate temporary openings in forms at inconspicuous locations.

F. 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.

G. Cleaning and Tightening: Thoroughly clean forms and adjacent surfaces to receive concrete. Remove rust, chips, wood, sawdust, dirt, or other debris just before placing concrete. Retighten forms and bracing before placing concrete, as required, to prevent mortar leaks and maintain proper alignment.

H. Verify that forms are clean and free of rust before applying release agent.

I. Where new concrete is to be bonded to previously placed concrete, prepare existing surface by cleaning with steel brush and applying bonding agent in accordance with manufacturer's instructions.

1. Use epoxy bonding system for bonding to damp surfaces, for structural load-bearing applications, and where curing under humid conditions is required.
2. Use latex bonding agent only for non-load-bearing applications.

3.03 VAPOR BARRIER INSTALLATION

A. Interior Slabs on Grade: Install vapor barrier under interior slabs on grade.
   1. Vapor Barrier Over Granular Fill: Install compactable granular fill before placing vapor retarder as shown on the drawings. Do not use sand.

B. Place vapor barrier sheeting in position with longest dimension parallel with direction of pour.

C. Lap joints minimum 6 inches. Seal joints, seams and penetrations watertight with manufacturer's recommended products and follow manufacturer's written instructions.

D. Repair all areas of damaged vapor retarder per manufacturer's recommendation before covering.

3.04 INSTALLING REINFORCEMENT AND OTHER EMBEDDED ITEMS

A. Fabricate and handle epoxy-coated reinforcing in accordance with ASTM D 3963.

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

C. Install welded wire reinforcement in maximum possible lengths, and offset end laps in both directions. Lap one mesh plus two inches. Splice laps with tie wire.

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

3.05 INSTALLING EMBEDDED ITEMS

A. Coordinate placement of embedded items with erection of concrete formwork and placement of form accessories.

B. Set and build into formwork anchorage devices and other embedded items required for other work that is attached to or supported by cast-in-place concrete. Use setting drawings, diagrams, instructions, and directions provided by suppliers of items to be attached.

C. Ensure that all inserts, devices and rough-ins by others are appropriately positioned and properly braced for installation of concrete.

3.06 PREPARING FORM SURFACES

A. General: Coat contact surfaces of forms with an approved, nonresidual, low-VOC, form-coating compound before placing reinforcement.

B. Do not allow excess form-coating material to accumulate in forms or come into contact with in-place concrete surfaces against which fresh concrete will be placed. Apply according to manufacturer's instructions.

3.07 PLACING CONCRETE

A. Place concrete in accordance with ACI 304R.

B. Place concrete for floor slabs in accordance with ACI 302.1R.

C. Notify Architect not less than 24 hours prior to commencement of placement operations.

D. Ensure reinforcement, inserts, waterstops, embedded parts, and formed construction joint devices will not be disturbed during concrete placement.

E. Finish floors level and flat, unless otherwise indicated, within the tolerances specified below.

F. Apply sealants in joint devices in accordance with Section 07 9000.

G. Inspection: Before placing concrete, inspect and complete formwork installation, reinforcing steel, and items to be embedded or cast in. Notify other trades to permit installation of their work.

H. Deposit concrete continuously or in layers of such thickness that no new concrete will be placed on concrete that has hardened sufficiently to cause seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as specified. Deposit concrete to avoid segregation at its final location.

I. Placing Concrete in Forms: Deposit concrete in forms in horizontal layers no deeper than 24 inches and in a manner to avoid inclined construction joints. Where placement consists of several layers, place each layer while preceding layer is still plastic to avoid cold joints.
   1. Consolidate placed concrete by mechanical vibrating equipment supplemented by hand-spading, rodding, or tamping. Use equipment and procedures for consolidation of concrete complying with ACI 309.
   2. Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations no farther than the visible effectiveness of the machine. Place vibrators to rapidly penetrate placed layer and at least 6 inches into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to 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 mix to segregate.

J. Placing Concrete Slabs: Deposit and consolidate concrete slabs in a continuous operation, within limits of construction joints, until completing placement of a panel or section.
   1. Consolidate concrete during placement operations so that concrete is thoroughly worked around reinforcement, other embedded items and into corners.
   2. Bring slab surfaces to correct level with a straightedge and strike off. Use bull floats or darbies to smooth surface free of humps or hollows. Do not disturb slab surfaces prior to beginning finishing operations.
   3. Maintain reinforcing in proper position on chairs during concrete placement.

K. Cold-Weather Placement: Comply with provisions of ACI 306 and as follows. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.

L. **When air temperature has fallen to or is expected to fall below 40º F**, uniformly heat water and aggregates before mixing to obtain a concrete mixture temperature of not less than 50º F and not more than 80º F at point of placement.
   1. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.
   2. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise accepted in mix designs.

M. Hot-Weather Placement: When hot weather conditions exist that would impair quality and strength of concrete, place concrete complying with ACI 305 and as specified.
   1. Cool ingredients before mixing to maintain concrete temperature at time of placement to below 90º F. Mixing water may be chilled or chopped ice may be used to control temperature, provided water equivalent of ice is calculated to total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.
   2. Cover reinforcing steel with water-soaked burlap if it becomes too hot, so that steel temperature will not exceed the ambient air temperature immediately before embedding in concrete.
   3. Fog spray forms, reinforcing steel, and subgrade just before placing concrete. Keep subgrade moisture uniform without puddles or dry areas.
   4. Use water-reducing retarding admixture when required by high temperatures, low humidity, or other adverse placing conditions, as acceptable to Architect.

N. Maintain records of concrete placement. Record date, location, quantity, air temperature, and test samples taken.

O. Place concrete continuously between predetermined expansion, control, and construction joints.

P. Do not interrupt successive placement; do not permit cold joints to occur.

Q. Place floor slabs in pattern indicated.

R. Saw cut joints within 24 hours after placing.

3.08 JOINTS

A. Construction Joints: Locate and install construction joints so they do not impair strength or appearance of the structure, as acceptable to Architect.

B. Provide keyways at least 1-1/2 inches deep in construction joints in slabs. Bulkheads designed and accepted for this purpose may be used for slabs.

C. Place construction joints perpendicular to main reinforcement. Continue reinforcement across construction joints except as indicated otherwise. Do not continue reinforcement through sides of strip placements.

D. Use bonding agent on existing concrete surfaces that will be joined with fresh concrete.

E. Isolation/Expansion Joints in Slabs-on-Grade: Construct isolation/expansion joints in slabs-on-grade at points of contact between slabs-on-grade and vertical surfaces, such as column pedestals, foundation walls, grade beams, and other locations, as indicated on drawings.

F. Contraction (Control) Joints in Slabs-on-Grade: Construct contraction joints in slabs-on-grade to form panels of patterns as shown. Use saw cuts 1/8 inch wide by one-fourth of slab depth or inserts 1/4 inch wide by one-fourth of slab depth, unless otherwise indicated.
   1. Form contraction joints by inserting premolded plastic, hardboard, or fiberboard strip into fresh concrete until top surface of strip is flush with slab surface. Tool slab edges round on each side of insert. After concrete has cured, remove inserts and clean groove of loose debris.
   2. Joint fillers and sealants are specified in Division 7 Section "Joint Sealants."

3.09 FLOOR FLATNESS AND LEVELNESS TOLERANCES

A. Maximum Variation of Surface Flatness:
   1. Exposed Concrete Floors: 1/4 inch in 10 feet.

B. Correct defects by grinding or by removal and replacement of the defective work. Areas requiring corrective work will be identified. Re-measure corrected areas by the same process.

3.10 CONCRETE FINISHING

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

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

3.11 MONOLITHIC SLAB FINISHES

A. Scratch Finish: Apply scratch finish to monolithic slab surfaces to receive concrete floor topping or mortar setting beds for tile, portland cement terrazzo, and other bonded applied cementitious finish flooring material, and where indicated. After placing slabs, finish surface to tolerances of F(F) 15 (floor flatness) and F(L) 13 (floor levelness) measured according to ASTM E 1155. Slope surfaces uniformly to drains where required. After leveling, roughen surface before final set with stiff brushes, brooms, or rakes.

B. Float Finish: Apply float finish to monolithic slab surfaces to receive trowel finish and other finishes as specified; slab surfaces to be covered with membrane or elastic waterproofing, membrane or elastic roofing, or sand-bed terrazzo; and where indicated. After screeding, consolidating, and leveling concrete slabs, do not work surface until ready for floating. Begin floating, using float blades or float shoes only, when surface water has disappeared, or when concrete has stiffened sufficiently to permit operation of power-driven floats, or both. Consolidate surface with power-driven floats or by hand-floating if area is small or inaccessible to power units. Finish surfaces to tolerances of F(F) 18 (floor flatness) and F(L) 15 (floor levelness) measured according to ASTM E 1155. Cut down high spots and fill low spots. Uniformly slope surfaces to drains. Immediately after leveling, refloat surface to a uniform, smooth, granular texture.

C. Trowel Finish: Apply a trowel finish to monolithic slab surfaces exposed to view and slab surfaces to be covered with resilient flooring, carpet, ceramic or quarry tile, paint, or another thin film-finish coating system. After floating, begin first trowel-finish operation using a power-driven trowel. Begin final troweling when surface produces a ringing sound as trowel is moved over surface. Consolidate concrete surface by final hand-troweling operation, free of trowel marks, uniform in texture and appearance, and finish surfaces to tolerances of F(F) 20 (floor flatness) and F(L) 17 (floor levelness) measured according to ASTM E 1155. Grind smooth any surface defects that would telegraph through applied floor covering system.

D. In areas with floor drains, maintain floor elevation at walls; pitch surfaces uniformly to drains at 1:100 nominal unless otherwise noted.

3.12 CURING AND PROTECTION

A. Comply with requirements of ACI 308R. Immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures, and mechanical injury.

B. Maintain concrete with minimal moisture loss at relatively constant temperature for period necessary for hydration of cement and hardening of concrete.
   1. Normal concrete: Not less than 7 days.
   2. High early strength concrete: Not less than 4 days.

C. Formed Surfaces: Cure by moist curing with forms in place for full curing period. Cure formed concrete surfaces, including underside of beams, supported slabs, and other similar surfaces, by moist curing with forms in place for the full curing period or until forms are removed. If forms are removed, continue curing by methods specified above, as applicable.

D. Surfaces Not in Contact with Forms:
   1. Initial Curing: Start as soon as free water has disappeared and before surface is dry. Keep continuously moist for not less than three days by water ponding, water-saturated sand, water-fog spray, or saturated burlap.
   2. Final Curing: Begin after initial curing but before surface is dry.
      a. Moisture-Retaining Cover: Place in widest practicable width with sides and ends lapped at least 3 inches. Seal in place with waterproof tape or adhesive. Immediately repair any holes or tears during curing period using cover material and waterproof tape.
      b. Curing Compound: Apply curing compound to concrete slabs as soon as final finishing operations are complete (within 2 hours and after surface water sheen has disappeared). Apply in two coats at right angles, using application rate recommended by manufacturer. Apply uniformly in continuous operation by power spray or roller according to manufacturer's directions. Recoat areas subjected to heavy rainfall within 3 hours after initial application. Maintain continuity of coating and repair damage during curing period. Use membrane curing compounds that will not affect surfaces to be covered with finish materials applied directly to concrete.

3.13 REMOVING FORMS

A. General: Formwork not supporting weight of concrete, such as sides of beams, walls, columns, and similar parts of the work, may be removed after cumulatively curing at not less than 50º F for 24 hours after placing concrete, provided concrete is hard enough to not be damaged by removing forms, and provided curing and protection operations are maintained.

B. Form-facing material may be removed 4 days after placement only if shores and other vertical supports have been arranged to permit removal of form-facing material without loosening or disturbing shores and supports.

3.14 FIELD QUALITY CONTROL

A. An independent testing agency will perform field quality control tests.

B. Provide free access to concrete operations at project site and cooperate with appointed firm.

C. Submit proposed mix design of each class of concrete to testing firm for review prior to commencement of concrete operations.

D. Tests of concrete and concrete materials may be performed at any time to ensure conformance with specified requirements.

E. Compressive Strength Tests: ASTM C 39. For each test, mold and cure four concrete test cylinders. Obtain test samples for every 50 cu yd or less of each class of concrete placed.
   1. Take one additional test cylinder during cold weather concreting, cured on job site under same conditions as concrete it represents.

F. Perform one slump test for each set of test cylinders taken, following procedures of ASTM C 143.
   1. Air Content: ASTM C 173, volumetric method for lightweight or normal weight concrete; ASTM C 231, pressure method for normal weight concrete; one for each day's pour of each type of air-entrained concrete.
   2. Concrete Temperature: ASTM C 1064: one test hourly when air temperature is 40º F and below, when 80º F and above, and one test for each set of compressive-strength specimens.

G. When frequency of testing will provide fewer than five strength tests for a given class of concrete, conduct testing from at least five randomly selected batches or from each batch if fewer than five are used.

H. When strength of field-cured cylinders is less than 85 percent of companion laboratory-cured cylinders, evaluate current operations and provide corrective procedures for protecting and curing the in-place concrete.

I. Strength level of concrete will be considered satisfactory if averages of sets of three consecutive strength test results equal or exceed specified compressive strength and no individual strength test result falls below specified compressive strength by more than 500 psi. Concrete strength shall not exceed 150% of specified strength at 28 days.

3.15 DEFECTIVE CONCRETE

A. Test Results: The testing agency shall report test results in writing to Architect, Engineer and Contractor within 24 hours of test. Test results shall include concrete type and class, design compressive strength at 28 days, concrete mix proportions and materials, compressive breaking strength, and type of break for both 7-day and 28-day tests.

B. Defective Concrete: Concrete not conforming to required lines, details, dimensions, tolerances or specified requirements.

C. Repair or replacement of defective concrete will be determined by the Architect. The cost of additional testing shall be borne by Contractor when defective concrete is identified.

D. Patching Defective Areas: Repair and patch defective areas with cement mortar immediately after removing forms, when acceptable to Architect.

E. Mix dry-pack mortar, consisting of one part portland cement to 2-1/2 parts fine aggregate passing a No. 16 mesh sieve, using only enough water as required for handling and placing.
   1. Cut out honeycombs, rock pockets, voids over 1/4 inch in any dimension, and holes left by tie rods and bolts down to solid concrete but in no case to a depth less than 1 inch. Make edges of cuts perpendicular to the concrete surface. Thoroughly clean, dampen with water, and brush-coat the area to be patched with bonding agent. Place patching mortar before bonding agent has dried.
   2. For surfaces exposed to view, blend white portland cement and standard portland cement so that, when dry, patching mortar will match surrounding color. Provide test areas to

verify mixture and color match before proceeding with patching. Compact mortar in place and strike-off slightly higher than surrounding surface.

F. Repairing Formed Surfaces: Remove and replace concrete having defective surfaces if defects cannot be repaired to satisfaction of Architect. Surface defects include color and texture irregularities, cracks, spalls, air bubbles, honeycomb, rock pockets, fins and other projections on the surface, and stains and other discolorations that cannot be removed by cleaning. Flush out form tie holes and fill with dry-pack mortar or precast cement cone plugs secured in place with bonding agent. Repair concealed formed surfaces, where possible, containing defects that affect the concrete's durability.

G. Repairing Unformed Surfaces: Test unformed surfaces, such as monolithic slabs, for smoothness and verify surface tolerances specified for each surface and finish. Correct low and high areas as specified. Test unformed surfaces sloped to drain for trueness of slope and smoothness by using a template having the required slope.
   1. Repair finished unformed surfaces containing defects that affect the concrete's durability. Surface defects include crazing and cracks in excess of 0.01 inch wide or that penetrate to the reinforcement or completely through nonreinforced sections regardless of width, spalling, popouts, honeycombs, rock pockets, and other objectionable conditions.
   2. Correct high areas in surfaces by grinding after concrete has cured for 14 days.
   3. Correct low areas in unformed surfaces during or immediately after completing surface finishing operations by cutting out low areas and replacing with patching mortar. Finish repaired areas to blend into adjacent concrete. Proprietary underlayment compounds may be used when acceptable to Architect.
   4. Repair defective areas, except random cracks and single holes not exceeding 1 inch in diameter, by cutting out and replacing with fresh concrete. Remove defective areas with clean, square cuts and expose reinforcing steel with at least 3/4-inch clearance all around. Dampen concrete surfaces in contact with patching concrete and apply bonding agent. Mix patching concrete of same materials to provide concrete of same type or class as original concrete. Place, compact, and finish to blend with adjacent finished concrete. Cure in same manner as adjacent concrete.

H. Perform structural repairs with prior approval of Architect for method and procedure, using specified epoxy adhesive and mortar.

I. Repair methods not specified above may be used, subject to acceptance of Architect.

J. Do not patch, fill, touch-up, repair, or replace exposed concrete except upon express direction of Architect for each individual area.

END OF SECTION

SECTION 04 2000
UNIT MASONRY

PART 1 - GENERAL

1.01 SUMMARY

A. Unit Masonry includes the following:
   1. Concrete Block.
   2. Common Brick.
   3. Mortar and Grout.
   4. Reinforcement and Anchorage.
   5. Embedded Flashing
   6. Accessories.

1.02 RELATED REQUIREMENTS

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

B. Section 01 2000 - Allowances: Unit masonry allowance.

C. Section 07 1113 - Bituminous Dampproofing: Dampproofing masonry surfaces.

D. Section 07 2100 - Thermal Insulation: Insulation for cavity spaces.

E. Section 07 6200 - Sheet Metal Flashing and Trim: Through-wall masonry flashings.

F. Section 07 9000 - Joint Sealers: Backing rod and sealant at control and expansion joints.

G. Section 08 1113 - Hollow Metal Frames: Frames installed in masonry openings in this section.

1.03 SUBMITTALS

A. See General and Supplementary General Conditions for submittal procedures.

B. Qualification Data: Indicating compliance with Quality Assurance Article.

C. Product Data: Provide data for masonry units, fabricated wire reinforcement, mortar, masonry accessories, and other fabrication materials.

D. Shop drawings for reinforcing detailing fabrication, bending, and placement of unit masonry reinforcing bars. Comply with ACI 315 "Details and Detailing of Concrete Reinforcing" showing bar schedules, stirrup spacing, diagrams of bent bars, and arrangement of masonry reinforcement.

E. Samples for initial selection purposes of colored masonry mortar samples showing full extent of colors available.

F. Samples for verification purposes of the following:
   1. Full-size units for each different exposed masonry unit required showing full range of exposed color, texture, and dimensions to be expected in completed construction.

G. Material certificates for the following signed by manufacturer and Contractor certifying that each material complies with requirements.
   1. Each type of concrete masonry unit.
   2. Each different cement product required for mortar and grout including name of manufacturer, brand, type, and weight slips at time of delivery.
   3. Each material and grade indicated for reinforcing bars.
   4. Each type and size of joint reinforcement.
   5. Each type and size of anchors, ties, and metal accessories.

H. Mix Designs: Submit to the architect and structural engineer mix designs applicable to the masonry units submitted for approval at least 30 days prior to any on-site deliveries.

I. Material test reports from a qualified independent testing laboratory employed and paid by Contractor indicating and interpreting test results relative to compliance of the following proposed masonry materials with requirements indicated:
   1. Mortar complying with property requirements of ASTM C 270.
   2. Grout mixes. Comply with the requirements of ASTM C476.
   3. Masonry units complying with requirements of ASTM C90.

J. Cold-weather construction procedures evidencing compliance with requirements specified in referenced unit masonry standard.

K. Hot-weather construction procedures evidencing compliance with requirements specified in referenced unit masonry standard.

1.04 QUALITY ASSURANCE

A. Comply with provisions of ACI 530/ASCE 5/TMS 402 and ACI 530.1/ASCE 6/TMS 602, except where exceeded by requirements of the contract documents. Revise ACI 530.1/ASCE 6 to exclude Section 1.7; and Articles 1.5.1.2, 1.5.1.3, 2.1.1.1, 2.1.1.2, and 2.3.3.9 and to modify Article 2.1.1.4 by deleting requirement for installing vent pipes and conduits built into masonry

B. Provide unit masonry and mortar that develops 1800 psi installed compressive strengths (f'm) at 28-day test.

C. 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 inspecting organization, by equivalent concrete masonry thickness, or by another means, as acceptable to authorities having jurisdiction.

D. Single-Source Responsibility for 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.

E. Single-Source Responsibility for Mortar Materials: Obtain mortar ingredients of uniform quality, including color for exposed masonry, from one manufacturer for each cementitious component and from one source and producer for each aggregate.

F. Grout shall have compressive strength per ASTM C109.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Deliver, handle, and store masonry units by means that will prevent mechanical damage and contamination by other materials.

B. Deliver masonry materials to project in undamaged condition. All brick shall be shipped to the site on wooden pallets.

C. Store and handle masonry units off the ground, under cover, and in a dry location to prevent their deterioration or damage due to moisture, temperature changes, contaminants, corrosion, and other causes. If units become wet, do not place until units are in an air-dried condition.

D. Store cementitious materials off the ground, under cover, and in dry location. Prepackaged cementitious materials shall be delivered to the site and stored in unbroken bags or other approved containers.

E. Store aggregates where grading and other required characteristics can be maintained and contamination avoided.

F. Store masonry accessories including metal items to prevent corrosion and accumulation of dirt and oil.

PART 2 - PRODUCTS

2.01 CONCRETE MASONRY UNITS

A. General: Comply with referenced standards and with requirements indicated below applicable to each form of concrete masonry unit required.

B. Provide special shapes where indicated and as follows:
   1. For lintels, corners, jambs, sash, control joints, headers, bonding, and other special conditions.
   2. Square-edged units for outside corners.
   3. All units shall be sharp, square and true and well cured.

C. Size: Provide concrete masonry units complying with requirements indicated below for size, manufactured to specified face dimensions within tolerances specified in the applicable referenced ASTM specification for concrete masonry units.
   1. Concrete Masonry Units: Manufactured to specified dimensions of 3/8 inch less than nominal widths by nominal heights by nominal lengths indicated on drawings.

D. Hollow Load-Bearing Concrete Masonry Units: ASTM C 90, Grade N and as follows:
   1. Unit Compressive Strength: Provide units with minimum average net area compressive strength of 1800 psi, but not less than the unit compressive strengths required to produce concrete unit masonry construction of compressive strength indicated.
   2. Weight Classification: Lightweight.
   3. Weight: The dry weight of 2 core Lightweight Masonry Concrete Units shall not exceed pounds shown in table below when tested in accordance with ASTM C-140:
      a. 6x8x16-20 pounds 6x8x16-75% Solid-29 pounds
      b. 8x8x16-26 pounds 8x8x16-75% Solid-38 pounds
      c. 12x8x16-39 pounds 12x8x16-75% Solid-58 pounds
   4. Thickness: Comply with UL618, Table 4 for equivalent thicknesses of fire rated units.
   5. Aggregates: Conform to ASTM Specification C-331, "Lightweight Aggregates for Concrete Masonry Units." Expanded shale produced by rotary kiln process, shall be graded (#4 to 0 gradation, Table 1 of ASTM C-331) to assure constant texture.
      a. The use of coal cinder aggregate or similar waste products will not be allowed. The blending of screenings or any other deleterious substance which will impair the fire rating or the insulation value of the unit is prohibited.
      b. All units shall be free of organic impurities that will cause rusting, staining or pop outs, and shall contain no comutible matter.

E. Solid Load-Bearing Concrete Masonry Units: ASTM C 90, Grade N and as follows:
   1. Unit Compressive Strength:
   2. Weight Classification: Lightweight.

F. Concrete Building Brick: Provide lightweight units with minimum average net area compressive strength of 3500 psi, but not less than the unit compressive strengths required for concrete unit masonry construction of compressive strength indicated, per ASTM C 55.

2.02 BRICK UNITS

A. General: Provide shapes indicated with exposed surfaces finished for ends of sills and caps and for similar applications that would otherwise expose unfinished brick surfaces for each form of brick required.

B. Facing Brick: ASTM C 216, Type FBS, Grade MW.
   1. Color and texture: Match Existing Building Brick.
   2. Size: Bricks manufactured to the following actual dimensions within tolerances specified in ASTM C 216:
      a. Modular. 3½ to 3-5/8 inches thick by 2-3/8 to 2-1/2 inches high by 7-1/2 to 7-5/8 inches long. (For Running Bond, Headers, Soldiers, Rowlocks and other shapes.)
   3. Special shapes: Provide special shapes of solid brick without cores or frogs for applications requiring brick of size, form, color, and texture on exposed surfaces that cannot be produced by sawing.
      a. Provide special shapes for applications where shapes produced by sawing would result in sawed surfaces being exposed to view.

b. Provide special shapes for applications where stretcher units cannot accommodate special conditions, including those at corners, movement joints, bond beams, sashes, and lintels.

4. Initial Rate of Absorption: Between 5 and 20 g/30 sq. in. per minute when tested per ASTM C 67.
5. Compressive strength: 3000 psi, measured in accordance with ASTM C 67.

2.03 MORTAR AND GROUT MATERIALS

A. Mortar and grout: As specified in Section 04 0511.

B. Masonry Cement: ASTM C 91, Type N.
1. Colored mortar: Premixed cement as required to match Architect's color sample if indicated, or if not indicated, as selected from manufacturer's standard formulations. Comply with manufacturer's recommended pigment-to-cement ratio.

C. Portland Cement: ASTM C 150, Type I or II, except Type III may be used for cold-weather construction'; color as required to produce approved color sample.

D. Hydrated Lime: ASTM C 207, Type S.

E. Mortar Aggregate: ASTM C 144, except for joints less than 1/4 inch use aggregate graded with 100 percent passing the No. 16 sieve.

F. Grout Aggregate: ASTM C 404.

G. Pigments for Colored Mortar: Pure, concentrated mineral pigments specifically intended for mixing into mortar and complying with ASTM C 979.

H. Color(s): As selected by Architect from manufacturer's full range.

I. Water: Clean and potable.

2.04 REINFORCEMENT AND ANCHORAGE

A. Manufacturers of Joint Reinforcement and Anchors: Subject to compliance with requirements, manufacturers offering joint reinforcement and anchors that may be incorporated in the Work include:
1. Dur-O-Wal.
2. Hohmann & Barnard, Inc (including Dur-O-Wal brand).
3. Masonry Reinforcing Corporation of America.

B. Reinforcing Steel: ASTM A 615 Grade 60 (420) deformed billet bars.
1. Deformed Reinforcing Wire: ASTM A 496.
2. Plain Welded Wire Fabric: ASTM A 185.

C. Joint Reinforcement: Provide joint reinforcement complying with requirements of referenced unit masonry standard and this article, formed from galvanized carbon steel wire, coating class as required by referenced unit masonry standard for application indicated.
1. Description: Welded-wire units prefabricated with deformed continuous side rods and plain cross rods into straight lengths of not less than 10 feet, with prefabricated corner and tee units, and complying with requirements indicated below:
a. ASTM A 82/A 82M steel wire, hot dip galvanized after fabrication to ASTM A 153/153M, Class B.
b. Wire Diameter for Side Rods: 0.1875 inch (3/16 inch).
c. Wire Diameter for Cross Rods: 0.1483 inch (9 gage).
d. Width: As required to provide not more than 1 inch and not less than 1/2 inch of mortar coverage on each exposure
2. Single-Wythe Masonry: Provide type as follows with single pair of side rods:
a. Ladder design with perpendicular cross rods spaced not more than 16 inches o.c., for reinforced walls.
3. Multi-Wythe Masonry: Provide type as follows:
a. Ladder design, fabricated with moisture drip, with perpendicular cross spaced not more than 16 inches o.c. and number of side rods as follows for reinforced walls:

b. Tab design with single pair of side rods and rectangular box-type cross ties spaced not more than 16 inches o.c.; with side rods spaced for embedment within each face shell of backup wythe and ties extended to engage the outer wythe by at least 1-1/2 inches.
c. Use units with adjustable 2-piece rectangular ties where horizontal joints of facing wythe do not align with those of backup by more than and where indicated.

D. Ties and Anchors, General:
1. Provide ties and anchors specified in subsequent articles that comply with requirements for metal and size of referenced unit masonry standard and of this article.
2. Galvanized Carbon Steel Wire: 0.1875 inch diameter ASTM A 82, coating class as required by referenced unit masonry standard for application indicated.
3. Galvanized Steel Sheet: As follows:
a. ASTM A 526 (commercial quality), Coating Designation G60, steel sheet zinc-coated by hot-dip process on continuous lines prior to fabrication, for sheet metal ties and anchors completely embedded in mortar.
b. ASTM A 366 (commercial quality) cold-rolled carbon steel sheet hot-dip galvanized after fabrication to comply with ASTM A 153, Class B2 (for unit lengths over 15 inches) and Class B3 (for unit lengths under 15 inches), for sheet metal ties and anchors exposed to the weather and not completely embedded in mortar and grout.
c. Galvanized Steel Sheet Thickness: .0635 inch (16 gage) for steel sheet hot-dip galvanized by continuous process prior to fabrication.
d. Thickness of Steel Sheet Galvanized After Fabrication: .0598 inch (16 gauge) uncoated thickness of steel sheet hot-dip galvanized after fabrication.
4. Galvanized Heavy-Thickness Steel Sheet: ASTM A 635 (commercial quality) hot-rolled carbon steel sheet hot-dip galvanized after fabrication to comply with ASTM A 525, Class B3, for rigid anchors fabricated from steel sheet or strip 0.180 inch thick or greater.
5. Steel Plates and Bars: ASTM A 36, hot-dip galvanized to comply with ASTM A 123 or ASTM A 153, Class B3, as applicable to size and form indicated.

E. Bent Wire Ties: Individual units prefabricated from bent wire to comply with requirements indicated below:
1. Tie Shape for Solid Masonry Unit Construction: Z-shaped ties with ends bent 90 degrees to provide hooks not less than 2 inches long.
2. For Masonry Where Coursing Between Wythes Align: Unit ties bent from one piece of wire.

F. Miscellaneous Anchors:
1. Unit Type Masonry Inserts in Concrete: Cast iron or malleable iron inserts as indicated.
2. Dovetail Slots: Furnish dovetail slots, with filler strips, of slot size indicated, fabricated from 0.0336-inch (22-gage) sheet metal.
3. Anchor Bolts: Headed steel bolts complying with A 36; with ASTM A 563 hex nuts and, where indicated, flat washers; hot-dip galvanized to comply with ASTM A 153, Class C; of diameter and length indicated and in the following configurations:

G. Postinstalled Anchors: Anchors as described below, with capability to sustain, without failure, load imposed within factors of safety indicated, as determined by testing per ASTM E 488, conducted by a qualified independent testing laboratory.
1. Type: Expansion anchors.
2. Corrosion Protection: Carbon steel components zinc-plated to comply with ASTM B 633, Class Fe/Zn 5 (5 microns) for Class SC 1 service condition (mild).
3. For cast-in-place and postinstalled anchors in concrete: Capability to sustain, without failure, a load equal to 4 times loads imposed by masonry.
4. For postinstalled anchors in grouted concrete masonry units: Capability to sustain, without failure, a load equal to 6 times loads imposed by masonry.

2.05 FLASHINGS

A. Embedded Flashing Materials:

1. Laminated Flashing: Manufacturer's standard 3 oz. per sq. ft. copper sheet flashing bonded with asphalt between 2 layers of heavy coated kraft paper. Use where flashing is fully concealed in masonry.
2. Adhesive for Flashings: Of type recommended by manufacturer of flashing material.

2.06 ACCESSORIES

A. Nonmetallic Expansion Joint Strips: Premolded filler strips complying with ASTM D 1056, Type 2 (closed cell), Class A (cellular rubber and rubber-like materials with specific resistance to petroleum base oils), Grade 1 (compression-deflection range of 2-5 psi), compressible up to 35 percent, of width and thickness indicated, formulated from neoprene.

B. Preformed Control Joint Gaskets: Unless otherwise shown, masonry walls shall have control joints at a maximum spacing of 30’-0” c/c. Material as indicated below, designed to fit standard sash block and to maintain lateral stability in masonry wall; size and configuration as indicated.
   1. PVC: Conforming to ASTM D 2287, Designation PVC 654-4.
   2. Available Products:
      a. "Rapid Control Joint D/A2001 or D/A2025" Dur-O-Wall, Inc.
      b. "Control Joint 2901 or 2900" Masonry Reinforcing Corporation of America.
      c. "Rub 021 Regular or Rub Oil Tee" National Wire Products/Industries.
      d. Substitutions: See General Conditions.

C. Cavity Mortar Control: Semi-rigid polyethylene or polyester mesh panels, sized to thickness of wall cavity, and designed to prevent mortar droppings from clogging weeps and cavity vents and allow proper cavity drainage.
   1. Mortar Diverter: Panels designed for installation at flashing locations.

D. Bond Breaker Strips: Asphalt-saturated organic roofing felt complying with ASTM D 226, Type I (No. 15 asphalt felt).

E. Weep Hole Vents: Provide one-piece, ultraviolet-resistant polypropylene co-polymer, multi-passage configuration, designed to weep moisture in masonry cavity to exterior, sized to fill head joints with outside face held back 1/8 inch from exterior face of masonry, in color selected from manufacturer's standard.
   1. Subject to compliance with requirements, weep hole/ventilators that may be incorporated in the work include, but are not limited to:
      a. Cellvent, Blok-Lok Limited.
      b. Cell Vent, Dur-O-Wal, Inc.
      c. Quadro-Vent, Hohmann & Barnard, Inc.
      d. Cell Vent, Wirebond

F. Proprietary Acidic Cleaner: Manufacturer's standard-strength, general-purpose cleaner designed for removing mortar/grout stains, efflorescence, and other new construction stains from new masonry surfaces of type indicated below without discoloring or damaging masonry surfaces; expressly approved for intended use by manufacturer of masonry to be cleaned:
   1. For masonry not subject to metallic oxidation stains, use formulation consisting of a concentrated blend of surface-acting acids, chelating, and wetting agents.
   2. For dark colored masonry not subject to metallic oxidation stains, use formulation consisting of a liquid blend of surface-acting acids and special inhibitors.
   3. For masonry subject to metallic oxidation stains, use formulation consisting of a liquid blend of organic and inorganic acids and special inhibitors.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine conditions, with Installer present, for compliance with requirements for installation tolerances and other specific conditions, and other conditions affecting performance of unit

masonry. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance of unit masonry.

1. Verify that field conditions are acceptable and are ready to receive masonry.
2. Verify that related items provided under other sections are properly sized and located.
3. Verify that built-in items are in proper location, and ready for roughing into masonry work.
4. Do not proceed until unsatisfactory conditions have been corrected.

3.02 PREPARATION

A. Direct and coordinate placement of metal anchors supplied for installation under other sections.

B. Provide temporary bracing during installation of masonry work. Maintain in place until building structure provides permanent bracing.

3.03 INSTALLATION, GENERAL

A. Comply with referenced unit masonry standard and other requirements indicated applicable to each type of installation included in Project.

B. Thickness: Build cavity and composite walls and other masonry construction to the full thickness shown. Build single-wythe walls to the actual thickness of the masonry units, using units of nominal thickness indicated.

C. Build chases and recesses as shown or required to accommodate items specified in this and other Sections of the Specifications. Provide not less than 8 inches of masonry between chase or recess and jamb of openings and between adjacent chases and recesses.

D. Leave openings for equipment to be installed before completion of masonry. After installation of equipment, complete masonry to match construction immediately adjacent to the opening.

E. Cut masonry units with motor-driven saws to provide clean, sharp, unchipped edges. Cut units as required to provide continuous pattern and to fit adjoining construction. Use full-size units without cutting where possible.

3.04 COLD AND HOT WEATHER REQUIREMENTS

A. Comply with requirements of ACI 530/530.1/ERTA or applicable building code, whichever is more stringent.

3.05 MORTAR MEASUREMENT AND MIXING

A. Prior to making successive batches of mortar, empty and clean all boxes, batchers, drums, etc.

B. 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 measuring device to make consistent volume measurements shall be used throughout the

C. 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.

D. The mortar mixer shall be charged in this order: add approximately one-half the water required, one-half the sand, the prepackaged mortar mix, 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.

E. Retempered mortar, mortar which has been permitted to set up, or work done using such material shall be discarded.

F. Mortars that have stiffened because of evaporation of water from the mortar may be retempered by adding water as frequently as needed to restore the required consistency. Mortars shall be used and placed in their final position within 2 hours after mixing. When the temperature is over 80 degrees F, the mortar shall be used within 1-1/2 hours after mixing. Mortar not used within these time periods shall be discarded.

3.06 MORTAR BEDDING AND JOINTING

A. Lay hollow concrete masonry units as follows:
   1. With full mortar coverage on horizontal and vertical face shells.
   2. Bed webs in mortar in starting course on footings and in all courses of piers, columns, and pilasters.
   3. For starting course on footings where cells are not grouted, spread out full mortar bed including areas under cells.

B. All joints shall be tooled to a uniform concave, 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.

C. Cut joints flush for masonry walls to be concealed or to be covered by other materials, unless otherwise indicated.

D. Masonry Cleaning: While laying the masonry units, 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 dropping; 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.

E. The masonry technique shall be such that mortar does not run down the face of the wall, or smear the mortar onto the face of masonry.

F. 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 bricklayer's brush made with medium masonry soft hair.

3.07 COURSING

A. Establish lines, levels, and coursing indicated. Protect from displacement.

B. Maintain masonry courses to uniform dimension. Form vertical and horizontal joints of uniform thickness.

C. Concrete Masonry Units:
   1. Bond: Running.
   2. Coursing: One unit and one mortar joint to equal 8 inches.

D. Brick Units:
   1. Bond: Running.
   2. Coursing: Three units and three mortar joints equal 8 inches.

3.08 PLACING AND BONDING

A. Lay out walls in advance for accurate spacing of surface bond patterns with uniform joint widths and for accurate locating of openings, movement-type joints, returns, and offsets. Avoid the use of less-than-half-size units at corners, jambs, and where possible at other locations.

B. Lay up walls to comply with specified construction tolerances, with courses accurately spaced and coordinated with other construction.

C. Bond Pattern for Exposed Masonry: Lay exposed masonry in one-half running bond with vertical joint in each course centered on units in courses above and below. Do not use units with less that nominal 4-inch horizontal face dimensions at corners or jambs.

D. Lay concealed masonry with all units in a wythe in running bond or bonded by lapping not less than 2 inches. Bond and interlock each course of each wythe at corners. Do not use units with less than nominal 4-inch horizontal face dimensions at corners or jambs.

E. Stopping and Resuming Work: In each course, rack back 1/2-unit length for one-half running bond or 1/3-unit length for one-third running bond; do not tooth. Clean exposed surfaces of set masonry, wet clay masonry units lightly (if required), and remove loose masonry units and mortar prior to laying fresh masonry.

F. Built-In Work: As construction progresses, build-in items specified under this and other Sections of the Specifications. Fill in solidly with masonry around built-in items. Fill space between hollow metal frames and masonry solidly with mortar, unless otherwise indicated. At exterior frames insert extruded polystyrene board insulation around perimeter of frame in thickness indicated but not less than 3/4 inch to act as a thermal break between frame and masonry.
   1. Where built-in items are to be embedded in cores of hollow masonry units, place a layer of metal lath in the joint below and rod mortar or grout into core.
   2. Fill cores in hollow concrete masonry units with concrete 3 courses (24 inches) under bearing plates, beams, lintels, posts, and similar items, unless otherwise indicated.

G. Lay solid masonry units in full bed of mortar, with full head joints, uniformly jointed with other work.

H. Lay hollow masonry units with face shell bedding on head and bed joints.

I. Buttering corners of joints or excessive furrowing of mortar joints is not permitted.

J. Remove excess mortar and mortar smears as work progresses.

K. Interlock intersections and external corners, except for units laid in stack bond.

L. Do not shift or tap masonry units after mortar has achieved initial set. Where adjustment must be made, remove mortar and replace.

M. Perform job site cutting of masonry units with proper tools to provide straight, clean, unchipped edges. Prevent broken masonry unit corners or edges.

N. Cut mortar joints flush where wall tile is scheduled or resilient base is scheduled.

3.09 CAVITY MORTAR CONTROL

A. Do not permit mortar to drop or accumulate into cavity air space or to plug weep/cavity vents. Strike joints facing cavities/air spaces flush.

B. Install cavity mortar diverter at base of cavity and at other flashing locations as recommended by manufacturer to prevent mortar droppings from blocking weep/cavity vents. Provide diverters full thickness of cavity.

3.10 REINFORCEMENT AND ANCHORAGE - GENERAL

A. Horizontal Joint Reinforcement: Provide continuous horizontal joint reinforcement as indicated. Install longitudinal side rods in mortar for their entire length with a minimum cover of 5/8 inch on exterior side of walls, 1/2 inch elsewhere.

B. Unless otherwise indicated on drawings or specified under specific wall type, install horizontal joint reinforcement 16 inches on center.

C. Install horizontal joint reinforcement 8 inches on center for single-wythe concrete masonry and masonry below grade unless otherwise indicated.

D. Lap joint reinforcement ends minimum 9 inches.

E. Cut or interrupt joint reinforcement at control and expansion joints, unless otherwise indicated.

F. Provide continuity at corners and wall intersections by use of prefabricated "L" and "T" sections. Cut and bend reinforcement units as directed by manufacturer for continuity at returns, offsets, column fireproofing, pipe enclosures, and other special conditions.

G. Fasten anchors to structural framing and embed in masonry joints as masonry is laid. Unless otherwise indicated on drawings or closer spacing is indicated under specific wall type, space anchors at maximum of 24 inches horizontally and 16 inches vertically.
   1. Provide an open space not less than 1 inch in width between masonry and structural member, unless otherwise indicated. Keep open space free of mortar or other rigid materials.
   2. Anchor masonry to structural members with flexible anchors embedded in masonry joints and attached to structure.

3.11 REINFORCEMENT AND ANCHORAGE - MASONRY

A. Masonry Back-Up: Embed anchors to bond veneer at maximum 16 inches on center vertically and 16 inches on center horizontally, with not less than one anchor for each 2 square feet of wall area. Place additional anchors within 1 foot of openings and ends of panels, so maximum spacing of anchors is 8 inches on center.

B. Stud Back-Up: Secure veneer anchors to stud framed back-up and embed into masonry veneer at maximum 16 inches on center vertically and 24 inches on center horizontally, with not less than one anchor for each 2 square feet of wall area. Place additional anchors within 1 foot of openings and ends of panels, so maximum spacing of anchors is 8 inches on center.

3.12 REINFORCEMENT AND ANCHORAGES - MULTIPLE WYTHE UNIT MASONRY

A. Use continuous horizontal joint reinforcement installed in horizontal mortar joints for bond tie between wythes, unless otherwise noted on drawings. Lap all splices 9" minimum.

B. Corners: Provide interlocking masonry unit bond in each course at corners, unless otherwise shown. Provide continuity with horizontal joint reinforcement at corners using prefabricated "L" units, in addition to masonry bonding.

C. Intersecting and Abutting Walls: Unless vertical expansion or control joints are shown at juncture, provide same type of bonding specified for structural bonding between wythes and space with horizontal joint reinforcement using prefabricated "T" units.

3.13 MASONRY FLASHINGS, WEEPS AND CAVITY VENTS

A. Whether or not specifically indicated, install masonry flashing to divert water to exterior at all shelf angles, lintels, ledges, and other locations where downward flow of water will be interrupted.
   1. Extend flashings full width at such interruptions and at least 4 inches into adjacent masonry or turn up at least 4 inches to form watertight pan at non-masonry construction.
   2. Remove or cover protrusions or sharp edges that could puncture flashings.
   3. Place through-wall flashings on sloping bed of mortar and cover with mortar.

B. Extend flashing from exterior face of outer wythe of masonry, through the outer wythe, turned up a minimum of 4 inches, and through the inner wythe to within 1/2 inches of the interior face of the wall in exposed masonry. Where interior surface of inner wythe is concealed by furring, carry flashing completely through the inner wythe and turn up approximately 2 inches, unless otherwise indicated.

C. Install flashing in masonry veneer walls as specified above, but carry flashing up face of sheathing at least 8 inches and behind air infiltration barrier/building paper.

D. Install reglets and nailers for flashing and other related construction where shown to be built into masonry.

E. Install weeps in veneer and cavity walls at 24 inches on center horizontally in exterior wythes of the first course of masonry immediately above through-wall flashing, above shelf angles and lintels, and at bottom of walls.
   1. Form weep holes with product specified in Part 2 of this Section.
   2. In insulated cavities/air spaces cover cavity/air space side of open weep holes with copper or plastic insect screening before placing loose-fill masonry insulation in cavity.

F. Cut off flashing flush with face of wall after masonry wall construction is completed.

G. Lap end joints of flashings at least 6 inches and seal watertight with mastic or elastic sealant.

3.14 LINTELS

A. Install steel lintels where indicated.

B. Provide masonry lintels where shown and wherever openings of more than 1'-0" for brick size units and 2'-0" for block size units are shown without structural steel or other supporting lintels. Temporarily support formed-in-place lintels. For hollow concrete masonry unit walls, use

specially formed bond beam units with reinforcement bars placed as indicated and filled with coarse grout. Reinforcement bars shall be #4 minimum unless otherwise noted.

C. Provide minimum bearing of 8 inches at each jamb on grouted masonry, unless otherwise indicated.

D. All lintels in exterior masonry walls shall be **hot dipped galvanized**.

3.15 GROUTED COMPONENTS

A. Do not place grout until entire height of masonry to be grouted, as indicated on the drawings, has attained sufficient strength to resist pressure.

B. Do not exceed the following pour heights for fine grout:
   1. For minimum widths of grout spaces of 3/4 inch or for minimum grout space of hollow unit cells of 1-½ by 2 inches, pour height of 12 inches.
   2. For minimum widths of grout spaces of 2 inches or for minimum grout space of hollow unit cells of 2 by 3 inches, pour height of 60 inches.
   3. For minimum widths of grout spaces of 2-½ inches or for minimum grout space of hollow unit cells of 2-½ by 3 inches, pour height of 12 feet.
   4. For minimum widths of grout spaces of 3 inches or for minimum grout space of hollow unit cells of 3 by 3 inches, pour height of 24 feet.

C. Do not exceed the following pour heights for coarse grout:
   1. For minimum widths of grout spaces of 1-½ inches or for minimum grout space of hollow unit cells of 1-½ by 3 inches, pour height of 12 inches.
   2. For minimum widths of grout spaces of 2 inches or for minimum grout space of hollow unit cells of 2-½ by 3 inches, pour height of 60 inches.
   3. For minimum widths of grout spaces of 2-½ inches or for minimum grout space of hollow unit cells of 3 by 3 inches, pour height of 12 feet.
   4. For minimum widths of grout spaces of 3 inches or for minimum grout space of hollow unit cells of 3 by 4 inches, pour height of 24 feet.

D. Provide cleanout holes at least 3 inches in least dimension for grout pours over 60" in height.

E. Provide cleanout holes at each vertical reinforcing bar.

F. At solid grouted masonry, provide cleanout holes at not more than 32" o.c.

G. Reinforce bond beams with 2, No. 4 bars, bottom, unless otherwise indicated.

H. Lap splices minimum 48 bar diameters.

I. Support and secure reinforcing bars from displacement. Maintain position within 1/2 inch of dimensioned position.

J. Place and consolidate grout fill without displacing reinforcing.

K. At bearing locations, fill masonry cores with grout either side of opening as indicated on the drawings.

3.16 CAVITY WALL INSULATION

A. On units of plastic insulation, install small pads of adhesive spaced approximately 1'-0" o.c. both ways on inside face or attach to inside face with plastic fasteners designed for this purpose. Press units firmly against inside wythe of masonry.

B. Fit courses of insulation between wall ties and other confining obstructions in cavity, with edges butted tightly both ways. Cut and fit insulation tightly to protrusions or interruptions to the insulation plane.

C. Extend boards over expansion joints, unbounded to wall at one side of joint.

D. Fill all cracks and open gaps in insulation with crack sealer compatible with insulation and masonry.

E. Supplement adhesive attachment by securing boards with 2-piece wall ties designed for this purpose and specified herein.

3.17 CONTROL AND EXPANSION JOINTS

A. General: Install control and expansion joints in unit masonry where indicated. Build in related items as the masonry progresses. Do not form a continuous span through movement joints unless provisions are made to prevent in-plane restraint of wall or partition movement.

B. Form control joints in concrete masonry. Install special shapes designed for control joints. Install bond breaker strips at joint. Keep head joints free and clear of mortar or rake joint.

3.18 BUILT-IN WORK

A. As work progresses, install built-in metal door frames and other items to be built into the work and furnished under other sections.

B. Install built-in items plumb, level, and true to line.

C. Bed anchors of metal door and glazed frames in adjacent mortar joints. Fill frame voids solid with grout.

3.19 TOLERANCES

A. Maximum Variation From Unit to Adjacent Unit: 1/16 inch.

B. Maximum Variation from Plane of Wall: 1/4 inch in 10 ft and 1/2 inch in 20 ft or more.

C. Maximum Variation from Plumb: 1/4 inch per story non-cumulative; 1/2 inch in two stories or more.

D. Maximum Variation from Level Coursing: 1/8 inch in 3 ft and 1/4 inch in 10 ft; 1/2 inch in 30 ft.

E. Maximum Variation of Joint Thickness: 1/8 inch in 3 ft.

F. Maximum Variation from Cross Sectional Thickness of Walls: 1/4 inch.

3.20 REPAIRING, POINTING, AND CLEANING

A. Remove and replace masonry units that are loose, chipped, broken, stained, or otherwise damaged or if units do not match adjoining units. Install new units to match adjoining units and in fresh mortar or grout, pointed to eliminate evidence of replacement.

B. Pointing: During the tooling of joints, enlarge any voids or holes, except weep holes, and completely fill with mortar. Point-up all joints including corners, openings, and adjacent construction to provide a neat, uniform appearance, prepared for application of sealants. The mortar mix shall be controlled so that after curing of the mortar, no difference in texture or color exists with that of adjacent masonry.

C. Final Cleaning: After mortar is thoroughly set and cured (one month minimum), clean exposed masonry as follows:
   1. Remove large mortar particles by hand with wooden paddles and nonmetallic scrape hoes or chisels.
   2. Test cleaning methods on sample wall panel; leave 1/2 panel uncleaned for comparison purposes. Obtain Architect's approval of sample cleaning before proceeding with cleaning of masonry.
   3. Protect adjacent stone and nonmasonry surfaces from contact with cleaner by covering them with liquid strippable masking agent, polyethylene film, or waterproof masking tape.
   4. Wet wall surfaces with water prior to application of cleaners; remove cleaners promptly by rinsing thoroughly with clear water.
   5. Clean brick by means of bucket and brush hand-cleaning method described in BIA "Technical Note No. 20 Revised" using the following masonry cleaner:
      a. Proprietary acidic cleaner; apply in compliance with directions of acidic cleaner manufacturer.
   6. High pressure water and sandblasting shall not be used for cleaning except with the recommendation of the brick manufacturer, and the written approval of the architect.
   7. Rinse small areas of walls with water sufficient to remove all cleaning solutions immediately after cleaning.
   8. Clean concrete masonry by means of cleaning method indicated in NCMA TEK 45 applicable to type of stain present on exposed surfaces.

3.21 PROTECTION

A. Protection: Provide final protection and maintain conditions, in a manner acceptable to Installer, that ensure unit masonry is without damage and deterioration at time of Substantial Completion.

B. Without damaging completed work, provide protective boards at exposed external corners that are subject to damage by construction activities.

END OF SECTION

SECTION 05 2100
STEEL JOIST FRAMING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Open web steel joists and shear stud connectors, joist bridging and attached seats and anchors.

1.02 RELATED REQUIREMENTS

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

B. Section 04 2000: Placement of anchors for embedding into masonry.

C. Section 05 3100 - Steel Decking.

1.03 SUBMITTALS

A. See General and Supplementary General Conditions for submittal procedures.

B. Qualification Data: Indicating compliance with Quality Assurance Article.

C. Shop Drawings prepared under supervision of a licensed Structural Engineer: Indicate standard designations, joist coding, configurations, sizes, spacings, cambers, locations of joists, joist leg extensions, bridging, connections, attachments, and installation instructions. Provide templates or location drawings for installation of anchor bolts and metal bearing plates.

1. Include structural analysis data signed and sealed by the qualified North Carolina professional engineer who was responsible for its preparation.

D. Welders' Certificates: Submit manufacturer's certificates, certifying welders employed on the Work, verifying AWS qualification within the previous 12 months.

1.04 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in performing the work of this section shall be an SJI member.

B. Perform Work in accordance with SJI Standard Specifications Load Tables and SJI Technical Digest No.9.

C. Erector Qualifications: Company specializing in performing the work of this section.

D. Design connections not detailed on the drawings under direct supervision of a Professional Structural Engineer experienced in design of this work and licensed in the State in which the Project is located.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Transport, handle, store, and protect products to SJI requirements.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Steel Joists: Joists shall be furnished by an SJI member company.

2.02 MATERIALS

A. Open Web Joists: Of type and sizes indicated on the drawings.

B. Steel: Comply with SJI "Specifications" for chord and web sections.

C. Anchor Bolts, Nuts and Washers: ASTM A 307, plain.

D. Unfinished Threaded Fasteners: ASTM A 307, Grade A, regular hexagon type, low carb on steel.

E. Shear Stud Connectors: Made from ASTM A 108 Grade 1015 bars.

F. Structural Steel For Supplementary Framing and Joist Leg Extensions: ASTM A 36.

G. Welding Materials: AWS D1.1; type required for materials being welded.

H. Shop and Touch-Up Primer: SSPC-Paint 25, compatible with finish coating.

2.03 FABRICATION

A. General: Fabricate steel joists in accordance with SJI "Specifications."

B. Drill holes in chords for attachment of wood nailers where indicated. Weld plates to chords for attachment of joist bridging.

C. Extended End: Provide extended ends on joists where indicated, complying with SJI "Specifications" and load tables.

D. Special Seats: Provide special seats at bearing ends of joists as noted in the structural drawings to accommodate joist slope or depth requirements at the joist bearing.

E. Bridging: Provide horizontal or diagonal type bridging as indicated for joists, complying with SJI "Specifications" or exceeding SJI "Specifications" where shown on the drawings. Provide bridging anchors for ends of bridging lines terminating at walls or beams.

F. End anchorage: Provide end anchorages, including steel bearing plates, to secure joists to adjacent construction, comply with SJI "Specifications", unless otherwise noted.

2.04 FINISH

A. Shop prime joists per SJI "Specifications". Asphaltum paint is unacceptable.
   1. Do not prime surfaces that will be fireproofed, field welded, or in contact with concrete.

B. Prepare surfaces to be finished in accordance with SSPC-SP 2 or SSPC-SP 3.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions prior to beginning work.

3.02 ERECTION

A. Erect joists with correct bearing on supports.

B. Allow for erection loads. Provide sufficient temporary bracing to maintain framing safe, plumb, and in true alignment.

C. Coordinate the placement of anchors for securing loose bearing members furnished as part of the work of this section.

D. After joist alignment and installation of framing, field weld joist seats to steel bearing surfaces.

E. Position and field weld joist chord extensions and wall attachments.

F. Do not permit erection of decking until joists are bridged and secured or until completion of erection and installation of permanent bridging and bracing.

G. Do not field cut or alter structural members without approval of joist manufacturer.

H. After erection, prime welds, damaged shop primer, and surfaces not shop primed , except surfaces specified not to be primed.

3.03 TOLERANCES

A. Maximum Variation From Plumb: 1/4 inch.

B. Maximum Offset From True Alignment: 1/4 inch.

END OF SECTION

SECTION 05 3100
STEEL DECKING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Standard roof deck, as indicated on the drawings.

1.02 RELATED REQUIREMENTS

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

B. Section 05 2100 - Steel Joist Framing.

1.03 SUBMITTALS

A. See General and Supplementary General Conditions for submittal procedures.

B. Qualification Data: Indicating compliance with Quality Assurance Article.

C. Product Data: Provide deck profile characteristics, dimensions, structural properties, finishes, and attachment accessories for each type of required deck.

D. Shop Drawings: Indicate deck plan, support locations, projections, openings, reinforcement, pertinent details, accessories, and attachment instructions.

E. Submit manufacturer's installation instructions.

F. Welders Certificates: Certify welders employed on the Work, verifying AWS qualification within the previous 12 months.

1.04 QUALITY ASSURANCE

A. Codes and Standards: Comply with provisions of the following codes and standards, except as otherwise indicated.
   1. American Iron and Steel Institute (AISI), "Specification for the Design of Cold-Formed Steel Structural Members.
   2. American Welding Society (AWS), D1.3 "Structural Welding Code - Sheet Steel."
   3. Steel Deck Institute (SDI), "Design manual for Composite Decks, Form Decks and Roof Decks."

B. Installer Qualifications: Company specializing in performing the work of this Section with minimum five years of documented experience.

C. Qualifications of Field Welding: Use qualified welding processes and welding operators in accordance with "Welder Qualifications" procedures of AWS. Welded decking in place is subject to inspection and testing. Owner will bear expense of removing and replacing portions of decking for testing purposes if welds are found to be satisfactory. Remove work found defective and replace with new acceptable work.

D. Underwriters' Label: Provide metal floor deck units listed in Underwriters' Laboratories "Fire Resistance Directory", with each deck unit bearing the UL label and marking for specific system detailed.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Protect from weather with waterproof covering. Cut plastic wrap to encourage ventilation.

B. Store deck on dry wood sleepers; slope for positive drainage.

C. Protect from bending and scarring.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Steel Deck: Subject to compliance with requirements, available manufacturers offering products that may be incorporated in the Work include, but are not limited to:
   1. Canam Steel Corporation.
   2. Consolidated Systems, Inc.
   3. Cordeck.
   4. Nucor-Vulcraft Group.
   5. Wheeling Corrugating Co.
   6. Substitutions: See General Conditions.

B. Products for use on this Project shall be from a single manufacturer unless otherwise noted.

2.02 DECK MATERIALS

A. Steel for Painted Metal Deck Units: ASTM A 1008, grade as required to comply with SDI specifications.

2.03 STEEL DECK

A. All Deck Types: Provide deck configurations that comply with SDI "Specifications."

B. Roof Deck: Non-composite type, fluted steel sheet of type, gage and section properties indicated on the drawings.
   1. Form deck units in lengths to span three or more supports, with flush, telescoped, or nested 2-inch laps at ends and interlocking or nested side laps or metal thickness, depth, and width as indicated. Laps of edges of sheets shall be mechanically fastened by methods indicated on the drawings.

2.04 ACCESSORY MATERIALS

A. Bearing Plates and Angles: ASTM A 36.

B. Sheet Metal Accessories: ASTM A 526, commercial quality, galvanized.

C. Welding Materials: AWS D1.1.

D. Fasteners: Galvanized hardened.

E. Weld Washers: Mild steel, uncoated, 3/4 inch outside diameter, 1/8 inch thick.

F. Shop and Touch-Up Primer: SSPC-Paint 25, zinc oxide or SSPC-Paint 15.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions prior to beginning work.

3.02 INSTALLATION

A. Erect metal deck in accordance with latest edition of SDI Design Manual, manufacturer's instructions, and shop drawings.

B. Place deck units on supporting steel framework and adjust to final position with ends accurately aligned and bearing on supporting members before being permanently fastened. Do not stretch or contract side lap interlocks. End laps shall occur only over bearing points, and shall be not less than 2 inches.

C. Align deck units for entire length and with close alignment at ends of abutting units.

D. Place deck units flat and square, secured to adjacent framing without warp or deflection.

E. Coordinate and cooperate with structural steel erector in locating decking bundles to prevent overloading of structural elements.

F. Fasten deck to steel support members at ends and intermediate supports as indicated on the drawings.
   1. Welding: Use fusion welds through weld washers.
   2. Fasten roof deck units to steel supporting members with TEK screws or by fusion welds not less than 5/8-inch-diameter puddle welds or elongated welds of equal strength.
   3. Comply with AWS requirements and procedures for manual shielded metal arc welding, appearance and quality of welds, and methods used in correcting welding work. Use welding washers for fastening deck less than 22 gage in thickness.
   4. Powder-actuated or pneumatically driven mechanical fasteners may be used in lieu of welding. Locate and install mechanical fasteners as indicated. Load capacity of pins or screws shall equal that of 5/8" puddle weld.
   5. Uplift Loading; Install and anchor roof deck units to resist gross uplift loading of 45 lbs. psf at eave overhang and 30 lbs. psf for other roof areas.

G. Weld deck in accordance with AWS D1.3.

H. Cutting and Fitting: Cut and neatly fit deck units and accessories around other work projecting through or adjacent to decking, as shown.

I. Openings: Cutting openings through the deck less than 16 inches square in area, and all skew cutting, shall be performed in the field. Cutting of openings for pipe, conduit, vents and stacks shall be performed by the trade involved. Holes shall be saw cut without affecting the integrity of the load capacity of deck. Holes and openings greater than 6 inches in diameter shall be cut and framed as detailed or as specified on the Drawings.

J. Reinforcement of Openings: Provide additional metal reinforcement and closure pieces as required for strength, continuity of decking, and support of other work as shown.

K. Provide metal closure strips at open uncovered ends and edges of roof decking and in voids between decking and other construction. Weld into position to provide a complete decking installation.

L. Weld stud shear connectors through steel deck to structural members below.

M. Provide UL-approved punched hanger slots between cells or flutes of lower element where floor deck units are to receive hangers for support of ceiling construction, air ducts, diffusers or lighting fixtures.

N. Immediately after welding deck and other metal components in position, coat welds, burned areas, and damaged surface coating, with touch-up primer.

END OF SECTION

SECTION 05 4000
COLD-FORMED METAL FRAMING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Formed steel stud exterior wall framing.

1.02 RELATED REQUIREMENTS

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

B. Section 05 3100 - Steel Decking.

C. Section 06 1000 - Rough Carpentry: Wood blocking and miscellaneous framing.

D. Section 07 2100 - Thermal Insulation: Insulation within framing members.

E. Section 07 2500 - Weather Barriers: Weather barrier over sheathing.

F. Section 09 2116 - Gypsum Board Assemblies: Gypsum-based sheathing.

1.03 PERFORMANCE REQUIREMENTS

A. AISI "Specifications": Calculate structural characteristics of cold-formed metal framing according to AIAI's "Specification for the Design of Cold-Formed Steel Structural Members" and "Load and Resistance Factor Design Specification for Cold-Formed Steel Structural Members" and the following:
   1. Center for Cold-Formed Steel Structures (CCFSS) Technical Bulletin, Vol.2, No. 1, February 1993 "AISI Specification Provisions for Screw Connections."

B. Structural Performance: Engineer, fabricate and erect cold-formed metal framing to withstand design loads within limits and under conditions required, unless otherwise indicated on the Drawings.
   1. Design framing systems to withstand design loads and lateral deflections no greater than 1/600 of the wall height and the following:
   2. Design framing systems to provide for movement of framing members without damage or overstressing, sheathing failure, connection failure, undue strain on fasteners and anchors, or other detrimental effects when subject to a maximum ambient temperature change (range) of 120 degrees F.

C. Engineering Responsibility: Engage a fabricator who assumes undivided responsibility for engineering cold-formed metal framing by employing a qualified professional Engineer to prepare design calculations, shop drawings, and other structural data.

1.04 SUBMITTALS

A. See General and Supplementary General Conditions for submittal procedures.

B. Qualification data for firms and persons specified in the Quality Assurance article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.

C. Product Data: For each type of cold-formed metal framing, accessory, and product specified.

D. Shop Drawings: Indicate layout, spacings, sizes thicknesses and types of cold-formed metal framing. Show fabrication, fastening and anchorage details, including mechanical fasteners. Show reinforcing channels, opening framing, supplemental framing, strapping, bracing, bridging, splices, accessories, connection details, and attachments to other units of Work.
   1. For cold-formed metal framing, include structural analysis data signed and sealed by the qualified North Carolina professional engineer who was responsible for its preparation. Include all members, connections and anchorages.

E. Mill Certificates signed by manufacturers of cold-formed metal framing certifying that their products comply with requirements, including uncoated steel thickness, yield strength, tensile strength, total elongation, and galvanized coating thickness.
   1. In lieu of mill certificates, submit test reports from a qualified independent testing agency evidencing compliance with requirements.

F. Welder Certificates signed by the Contractor certifying that welders comply with requirements.

G. Manufacturer's Installation Instructions: Indicate special procedures, conditions requiring special attention.

1.05 QUALITY ASSURANCE

A. Installer Qualifications: Company specializing in performing the work of this section with minimum 3 years of experience in projects similar in material, design and extent to that indicated for this Project, and with a record of successful in-service performance.

B. Welding Standards: Comply with applicable provisions of AWS D1.1 "Structural Welding Code - Steel" and AWS D1.3 "Structural Welding Code - Sheet Steel."

C. Professional Engineer Qualifications: A professional engineer legally authorized to practice in the jurisdiction where the Project is located and experienced in providing engineering services of the kind indicated that have resulted in the installation of cold-formed metal framing systems similar to this Project in material, design and extent, and that has a record of successful in-service performance.

D. Provide cold-formed metal framing identical to that tested as part of an assembly for fire resistance per ASTM E 119 by an independent testing agency acceptable to authorities having jurisdiction.
   1. Fire Resistance Ratings: As indicated by design designations listed in UL "Fire Resistance Directory."

1.06 ADMINISTRATIVE REQUIREMENTS

A. Coordinate with work of other sections that is to be installed in or adjacent to the metal framing system, including but not limited to structural anchors, cladding anchors, utilities, insulation, and firestopping.

1.07 DELIVERY, STORAGE AND HANDLING

A. Protect cold-formed metal framing from corrosion, deformation, and other damage during delivery, storage and handling.

B. Store cold-formed metal framing with protective waterproof covering, and ventilate to avoid condensation.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Metal Framing, Connectors, and Accessories: Subject to compliance with requirements, manufacturers offering products that may be incorporated in the Work include, but are not limited to, the following:
   1. Alabama Metal Industries Corp.
   2. ClarkDietrich Building Systems LLC.
   3. Consolidated Fabricators Corp.
   4. Consolidated Systems, Inc.
   5. Studco Building Systems US LLC.
   6. United States Steel
   7. Substitutions: See General Conditions.

2.02 MATERIALS

A. Galvanized Steel Sheet: ASTM A 446, zinc coated according to ASTM A 525, and as follows:
   1. Coating Designation: G 90 (Z 275).

2. Grade: Grade A, 33,000 psi minimum yield strength, 20 percent elongation.
3. Grade: Grade C, 40,000 psi minimum yield strength, 16 percent elongation.

2.03 FRAMING SYSTEM

A. Provide primary and secondary framing members, bridging, bracing, plates, gussets, clips, fittings, reinforcement, and fastenings as required to provide a complete framing system.

2.04 FRAMING MATERIALS

A. Studs and Track: ASTM C 955; studs formed to channel, "C", or "Sigma" shape with punched web; U-shaped track in matching nominal width and compatible height.
   1. Design Uncoated Steel Thickness: 18 gage (0.043 inch) unless otherwise indicated on the Drawings.
   2. Flange Width: 1-5/8 inches.

B. Steel Track: Manufacturer's standard U-shaped track, unpunched, of web depths indicated, with straight flanges, and complying with the following:
   1. Design Uncoated Steel Thickness: 18 gage (0.043 inch).
   2. Flange Width: Manufacturer's standard deep flange where indicated, standard depth elsewhere.

C. Framing Connectors: Factory-made formed steel sheet, ASTM A 653/A 653M SS Grade 50, with G60/Z180 hot dipped galvanized coating and factory punched holes.
   1. Structural Performance: Maintain load and movement capacity required by applicable code, when evaluated in accordance with AISI North American Specification for the Design of Cold Formed Steel Structural Members; minimum 16 gage, 0.06 inch thickness.
   2. Movement Connections: Provide mechanical anchorage devices that accommodate movement using slotted holes, screws and anti-friction bushings, while maintaining structural performance of framing. Provide movement connections where indicated on drawings.
      a. Where continuous studs bypass elevated floor slab, connect stud to slab in manner allowing vertical and horizontal movement of slab without affecting studs; allow for minimum movement of 1/2 inch.
      b. Where top of stud wall terminates below structural floor or roof, connect studs to structure in manner allowing vertical and horizontal movement of slab without affecting studs; allow for minimum movement of 1/2 inch.
   3. Provide non-movement connections for tie-down to foundation, floor-to-floor tie-down, roof-to-wall tie-down, joist hangers, gusset plates, and stiffeners.

2.05 FASTENERS

A. Cast-in-Place Anchor Bolts and Studs: ASTM A 307, Grade A (ASTM F 568, Property Class 4.6); carbon steel hex-head bolts and studs; carbon steel nuts; flat, unhardened steel washers. Hot dip galvanized per ASTM A 153/A 153M.

B. Expansion Anchors: Fabricated from corrosion-resistant materials, with capability to sustain, without failure, a load equal to 5 times the design load, as determined by testing per ASTM E 488 conducted by a qualified independent testing agency.

C. Power-Actuated Fasteners: Of type suitable for application intended, fabricated from corrosion resistant materials, with capability to sustain, without failure, a load equal to 10 times the design load, as determined by testing per ASTM E 1190 conducted by a qualified independent testing agency.

D. Mechanical Fasteners: Corrosion resistant coated, self-drilling, self-threading steel drill screws.
   1. Head Type: Low profile head beneath sheathing, manufacturer's standard elsewhere.

E. Welding Electrodes: Comply with AWS standards.

2.06 ACCESSORIES

A. Bracing, Furring, Bridging: Formed sheet steel, thickness determined for conditions encountered; material and finish to match framing components.

B. Shop and Touch-Up Primer: SSPC-Paint 15.

C. Galvanizing Repair Paint: SSPC-Paint 20, Type I - Inorganic.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that substrate surfaces are ready to receive work.

B. Verify field measurements and adjust installation as required.

3.02 INSTALLATION, GENERAL

A. Install cold-formed metal framing and accessories plumb, square, true to line, and with connections securely fastened, according to manufacturer's recommendations and the requirements of this Section.

B. Cut framing members by sawing or shearing. Do not torch cut.

C. Fasten cold-formed metal framing members by welding or screw fastening, as standard with fabricator. Wire tying of framing members is not permitted.
   1. Comply with AWS requirements and procedures for welding, appearance and quality of welds, and methods used in correcting welding work.
   2. Locate mechanical fasteners and install according to cold-formed metal framing manufacturer's instructions with screw penetrating joined members by not less than 3 screw threads.

3.03 INSTALLATION OF STUDS

A. Install components in accordance with manufacturers' instructions and ASTM C 1007 requirements.

B. Align floor and ceiling tracks; locate to wall layout. Secure in place with fasteners at maximum 24 inches on center. Coordinate installation of sealant with floor and ceiling tracks.

C. Construct corners using minimum of three studs. Install double studs at wall openings, door and window jambs.

D. Install load bearing studs full length in one piece. Splicing of studs is not permitted.

E. Provide temporary bracing and leave in place until framing is permanently stabilized.

F. Do not bridge building expansion and control joints with cold-formed metal framing. Independently frame both sides of joints.

G. Coordinate placement of insulation in multiple stud spaces made inaccessible after erection.

H. Install intermediate studs above and below openings to align with wall stud spacing.

I. Fasten reinforcement plate over web penetrations that exceed size of manufacturer's standard punched openings.

J. Install headers over wall openings wider than the stud spacing. Locate headers above openings as indicated. Fabricate headers of compound shapes indicated or required to transfer load to supporting studs, complete with clip-angle connectors, web stiffeners or gusset plates.
   1. Frame wall openings with not less that a double stud at each jamb of frame.
   2. Install runner tracks and jack studs above and below wall openings. Anchor tracks to jamb studs with clip angles or by welding, and space jack studs same as full-height walls.

K. Install horizontal bridging in stud system, spaced in rows not more than 48 inches apart. Fasten at each stud intersection.

L. Install sheet-steel diagonal bracing straps to both stud flanges, terminate at and fasten to reinforced top and bottom tracks. Fasten clip angle connectors to multiple studs at ends of bracing and anchor to structure.

M. Install supplementary framing, blocking and bracing in stud framing indicated to support fixtures, equipment, services, casework, heavy trim, furnishings and similar work requiring attachment to framing.

N. Install framing between studs for attachment of mechanical and electrical items, and to prevent stud rotation.

O. Install miscellaneous framing and connections, including supplementary framing, web stiffeners, clip angles, continuous angles, anchors and fasteners to provide a complete and stable wall framing system.

P. Touch-up field welds and damaged galvanized surfaces with galvanizing repair paint according to ASTM A 780 and the manufacturer's instructions.

3.04 TOLERANCES

A. Maximum Variation from Plumb, Level and True Position: 1/8 inch in 10 feet.

B. Maximum Variation of any Member from Plane: 1/8 inch.

END OF SECTION

SECTION 05 5000
METAL FABRICATIONS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Shop fabricated steel, aluminum, and miscellaneous metal items, including:
   1. Loose bearing and leveling plates.
   2. Loose steel lintels.
   3. Shelf and relieving angles.
   4. Miscellaneous framing and supports where framing and supports are not specified in other sections.

1.02 RELATED REQUIREMENTS

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

B. Section 04 2000 - Unit Masonry: Placement of metal fabrications in masonry.

1.03 SUBMITTALS

A. See Division 1 General Requirements for submittal procedures.

B. Qualification Data: Indicating compliance with Quality Assurance Article.

C. Shop Drawings: Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories. Include erection drawings, elevations, and details where applicable.
   1. Indicate welded connections using standard AWS A2.4 welding symbols. Indicate net weld lengths.
   2. Provide templates for anchors and bolts specified for installation under other Sections.

D. Samples representative of materials and finished products as may be requested by the Architect.

E. Welders' Certificates: Submit certification for welders employed on the project, verifying AWS qualification within the previous 12 months.

1.04 QUALITY ASSURANCE

A. Fabricator Qualifications: Engage a firm experienced in producing metal fabrications similar to those shown for this Project, with a record of successful in-service performance, and with sufficient capacity to produce the required units without delaying the Work.

B. Welding Standards: Comply with the applicable requirements of AWS D1.1 "Structural Welding Code - Steel" and AWS D1.3 "Structural Welding Code - Sheet Steel."

1.05 PROJECT CONDITIONS

A. Field Measurements: Check actual locations of walls and other construction to which metal fabrications must fit by accurate field measurements before fabrication. Show recorded measurements on final shop drawings. Where field measurements cannot be made without delaying the Work, guarantee dimensions and coordinate construction to ensure that actual field dimensions correspond to guaranteed dimensions.

PART 2 PRODUCTS

2.01 MATERIALS - STEEL

A. General: For metal fabrications exposed to view in the completed Work, provide materials selected for their surface flatness, smoothness and freedom from surface blemishes. Do not use materials with exposed pitting, seam marks, roller marks, rolled trade names or roughness.

B. Steel Sections: ASTM A 36.

C. Steel Tubing: ASTM A 500, Grade B cold-formed or ASTM A 501 hot-formed structural tubing. For exterior installations and where indicated, provide hot-dip galvanized coating per ASMT A 53.

D. Plates: ASTM A36.

E. Uncoated Sheet Steel: Commercial quality, cold-rolled steel sheet, ASTM A 366.

F. Galvanized Steel Sheet: Commercial quality, ASTM A 526, G90 coating designation unless otherwise indicated.

2.02 WELDING MATERIALS, FASTENERS & ANCHORS

A. General: For exterior use, or where built into exterior walls, provide plated fasteners complying with ASTM B633, Class Fe/Zn 25 for electrodeposited zinc coating. Select fasteners for the type, grade and class required.

B. Machine Screws: ANSI B18.6.3

C. Lag Bolts: ANSI B18.2.1 (ANSI B18.2.3.8M).

D. Wood Screws: Flat head, carbon steel, ANSI B18.6.1.

E. Plain Washers: Round, carbon steel, ANSI B18.22.1 (ANSI B18.22M).

F. Lock Washers: Helical, spring type, carbon steel, ANSI B18.21.1.

G. Expansion Anchors: Anchor bolt and sleeve assembly of material indicated below with capability to sustain, without failure, a load equal to 6 times the load imposed when installed in unit masonry and equal to 4 times the load imposed when installed in concrete as determined by testing per ASTM E 488 conducted by a qualified independent testing agency.
   1. Material: Group 1 alloy 304 or 316 stainless-steel bolts and nuts complying with ASTM F 593 (ASTM F 738M) and ASTM F 594 (ASTM F 836M).

H. Cast-in-Place and Postinstalled Anchors: Anchors fabricated from corrosion-resistant materials, capable of sustaining, without failure, a load equal to 6 times the load imposed when installed in unit masonry and equal to 4 times the load imposed when installed in concrete, as determined by testing per ASTM E 488, conducted by a qualified, independent testing agency. Anchors shall be cast-in-place anchors, expansion anchors or threaded or wedge type; galvanized ferrous castings, either ASTM A 47 (ASMT A 47M) malleable iron or ASTM A 27/A 27M cast steel.

I. Toggle Bolts: FS FF-B-588, tumble-wing type, class and style as required.

J. Bolts, Nuts, and Washers: Galvanized to ASTM A 153/A 153M where connecting galvanized components.

K. Welding Materials: AWS D1.1/D1.1M; type required for color match, strength and compatibility with materials being welded.

2.03 FABRICATION

A. Fit and shop assemble items in largest practical sections, for delivery to site.

B. Fabricate items with joints tightly fitted and secured. Locate joints where least conspicuous.

C. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.

D. Exposed Mechanical Fastenings: Flush countersunk screws or bolts; unobtrusively located; consistent with design of component, except where specifically noted otherwise.

E. Supply components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.

F. Allow for thermal movement resulting from the following maximum change (range) in ambient temperature in the design, fabrication, and installation of installed metal assemblies to prevent buckling, opening up of joints, and overstressing of welds and fasteners. Base design

calculations on actual surface temperatures of metals due to both solar heat gain and nighttime sky heat loss.
1. Temperature Change (Range): 100 deg F (55.5 deg C).

G. Shear and punch metals cleanly and accurately. Remove burrs.

H. Remove sharp or rough areas on exposed traffic surfaces.

I. Fabricate joints that will be exposed to weather in a manner to exclude water, or provide weep holes where water may accumulate.

2.04 LOOSE BEARING AND LEVELING PLATES

A. Provide loose bearing and leveling plates for steel items bearing on masonry or concrete construction, made flat, free from warps or twists, and of the required thickness and bearing area. Drill plates to receive anchor bolts and for grouting as required. Galvanize after fabrication.

2.05 LOOSE STEEL LINTELS

A. Fabricate from steel angles and shapes of size indicated for openings and recesses in masonry walls and partitions at locations indicated, and as required for miscellaneous mechanical openings.

B. Size loose lintels for equal bearing of 1 inch per foot (85 mm per meter) of clear span but not less than 8 inches (200 mm) bearing at each side of openings, unless otherwise indicated.

C. Galvanized finish.

2.06 SHELF AND RELIEVING ANGLES

A. Fabricate from steel angles of sizes indicated and for attachment to concrete framing. Provide slotted holes to receive 3/4-inch (19-mm) bolts, spaced not more than 6 inches (150 mm) from ends and not more than 24 inches (600 mm) o.c., unless otherwise indicated.

B. For cavity walls, provide vertical channel brackets to support shelf/relieving angles from back-up masonry and concrete. Align expansion joints in angles with indicated control and expansion joints in cavity wall exterior wythe.

C. Furnish wedge-type concrete inserts, complete with fasteners, to attach shelf angles to cast-in-place concrete.

D. Prime paint finish.

2.07 MISCELLANEOUS FRAMING, SUPPORTS, AND STEEL TRIM

A. General: Provide steel framing and supports for applications indicated that are not a part of structural steel framework as required to complete the Work.

B. Fabricate units to sizes, shapes, and profiles indicated and required to receive other adjacent construction retained by framing and supports. Fabricate from structural steel shapes, plates, and steel bars of welded construction using mitered joints for field connection. Cut, drill, and tap units to receive hardware, hangers, and similar items. Equip units with integrally welded anchors for casting into concrete or building into masonry. Furnish inserts if units must be installed after concrete is placed. Except as otherwise indicated, space anchors 24 inches o.c. and provide minimum anchor units in the form of steel straps 1-1/4 inches wide by 1/4 inch thick by 8 inches long.

2.08 FINISHES - STEEL

A. Prime paint all steel items.
1. Exceptions: Galvanize items to be embedded in masonry.
2. Exceptions: Stainless steel items.
3. Exceptions: Do not prime surfaces in direct contact with concrete, where field welding is required, and items to be covered with sprayed fireproofing.

B. Clean surfaces of rust, scale, grease, and foreign matter prior to finishing.

C. Prime Painting: One coat.

D. Galvanizing - General: The following items shall be galvanized:
   1. All steel material that either supports or is built into exterior exposed masonry construction, is outside the building thermal and moisture barrier, or is exposed to exterior weather conditions.
   2. All connections materials for galvanized members and for precast concrete.
   3. Items noted on the drawings to be galvanized.

E. Galvanizing of Structural Steel Members: Galvanize after fabrication to ASTM A 123/A 123M requirements. Provide minimum 1.7 oz/sq ft galvanized coating.

F. Galvanizing of Non-structural Items: Galvanize after fabrication to ASTM A 123/A 123M requirements.

2.09 PAINT

A. General: Primers shall be compatible with scheduled finish coatings.

B. Shop and Touch-Up Primer: SSPC-Paint 15.

C. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20, Type I - Inorganic or SSPC-Paint 20, Type II - Organic.

2.10 FABRICATION TOLERANCES

A. Squareness: 1/8 inch maximum difference in diagonal measurements.

B. Maximum Offset Between Faces: 1/16 inch.

C. Maximum Misalignment of Adjacent Members: 1/16 inch.

D. Maximum Bow: 1/8 inch in 48 inches.

E. Maximum Deviation From Plane: 1/16 inch in 48 inches.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that field conditions are acceptable and are ready to receive work.

3.02 PREPARATION

A. Clean and strip primed steel items to bare metal and aluminum where site welding is required.

B. Supply setting templates to the appropriate entities for steel items required to be cast into concrete or embedded in masonry.

3.03 INSTALLATION

A. Install items plumb and level, accurately fitted, free from distortion or defects.

B. Provide for erection loads, and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.

C. Field weld components indicated on drawings or shop drawings.

D. Perform field welding in accordance with AWS D1.1/D1.1M. Perform welding of galvanized steel in accordance with AWS D19. Steel surfaces shall be free of zinc in the area to be welded.

E. Obtain approval prior to site cutting or making adjustments not scheduled.

F. After erection, prime welds, abrasions, and surfaces not shop primed or galvanized, except surfaces to be in contact with concrete.

END OF SECTION

SECTION 06 1000
ROUGH CARPENTRY

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Preservative treated wood materials.

B. Concealed wood blocking, nailers, and supports.

C. Miscellaneous wood nailers, furring, and grounds.

D. Fasteners.

1.02 RELATED REQUIREMENTS

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

1.03 DELIVERY, STORAGE, AND HANDLING

A. General: Cover wood products to protect against moisture. Support stacked products to prevent deformation and to allow air circulation.

PART 2 PRODUCTS

2.01 GENERAL REQUIREMENTS

A. Dimension Lumber: Comply with PS 20 and requirements of specified grading agencies.

B. Grade Stamps: Provide lumber with each piece factory marked with grade stamp of inspection agency evidencing compliance with grading rule requirements and identifying grading agency, grade, species, moisture content at time of surfacing, and mill.

1. Grading Agency: Any grading agency whose rules are approved by the Board of Review, American Lumber Standard Committee (www.alsc.org) and who provides grading service for the species and grade specified; provide lumber stamped with grade mark unless otherwise indicated.

C. Where nominal sizes are indicated, provide actual sizes required by DOC PS 20 for moisture content specified. Provide dressed lumber, S4S, unless otherwise indicated. Where actual sizes are indicated, they are minimum dressed sizes for dry lumber. Provide dry lumber with 19 percent maximum moisture content at time of dressing for 2-inch nominal thickness or less, unless otherwise indicated.

D. Species: Spruce Pine or Southern Yellow Pine, unless otherwise indicated.

2.02 DIMENSION LUMBER FOR CONCEALED APPLICATIONS

A. Grading Agency: Southern Pine Inspection Bureau, Inc. (SPIB).

B. Sizes: Nominal sizes as indicated on drawings, S4S.

C. Moisture Content: S-dry or MC19.

D. Miscellaneous Framing, Blocking, Nailers, Grounds, and Furring:

1. Dimensions Lumber: Standard or No. 3.
2. Boards: No. 2 Grade.

2.03 CONSTRUCTION PANELS

A. Grading Agency: American Plywood Association (APA).

B. Each panel shall meet the requirements of the latest edition of U.S Product Standard PS 1, U.S. Product Standard PS 2, or APA PRP-108 Performance Standards.

C. Panel thickness, grade, exposure durability classification and Group number or Span Rating shall be at least equal to that indicated in the drawings and specifications.

D. All panels having an edge or face permanently exposed to weather shall be classed Exterior.

E. Application shall be in accordance with recommendations of the APA.

F. Blocking at Fascias: Plywood, PS 1, Grade C-D, Exposure I.

G. Other Applications:
   1. Plywood Concealed From View But Located Within Exterior Enclosure: PS 1, C-C Plugged or better, Exterior grade.
   2. Plywood Exposed to View But Not Exposed to Weather: PS 1, A-D, or better.
   3. Other Locations: PS 1, C-D Plugged or better.

2.04 ACCESSORIES

A. Fasteners and Anchors:
   1. Metal and Finish: Hot-dipped galvanized steel per ASTM A 153/A 153M for high humidity and preservative-treated wood locations, unfinished steel elsewhere.
   2. Drywall Screws: Bugle head, hardened steel, power driven type, length three times thickness of sheathing.
   3. Anchors: Toggle bolt type for anchorage to hollow masonry.

2.05 FACTORY WOOD TREATMENT

A. Treated Lumber and Plywood: Comply with requirements of AWPA U1 - Use Category System for wood treatments determined by use categories, expected service conditions, and specific applications.
   1. Preservative-Treated Wood: Provide lumber and plywood marked or stamped by an ALSC-accredited testing agency, certifying level and type of treatment in accordance with AWPA standards.

B. Preservative Treatment:
   1. Preservative Pressure Treatment of Lumber Above Grade: AWPA U1, Use Category UC3B.
      a. Kiln dry lumber after treatment to maximum moisture content of 19 percent.
      b. Treat lumber exposed to weather.
      c. Treat lumber in contact with roofing, flashing, or waterproofing.
      d. Treat lumber in contact with masonry or concrete.
      e. Treat all wood in exterior wall assemblies.

PART 3 EXECUTION

3.01 HANDLING AND INSTALLATION OF TREATED WOOD

A. Comply with AWPA Standard M4 for storage, handling, field fabrication and field treatment of all treated wood.

B. Apply preservative treatment in accordance with manufacturer's instructions.

C. Brush apply one coat of preservative treatment on wood in contact with cementitious materials and roofing and related metal flashings.

D. Treat site-sawn ends and holes.

E. Allow preservative to cure prior to erecting members.

F. Comply with all applicable local, state and federal regulations regarding disposal of treated wood products.

3.02 BLOCKING, NAILERS, AND SUPPORTS

A. Provide framing and blocking members as indicated or as required to support finishes, fixtures, specialty items, and trim.

END OF SECTION

SECTION 07 1113
BITUMINOUS DAMPPROOFING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Bituminous dampproofing.

1.02 RELATED REQUIREMENTS

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

B. Section 04 2000 - Unit Masonry: Unit masonry foundation walls below grade.

1.03 SUBMITTALS

A. See General and Supplementary General Conditions for submittal procedures.

B. Qualification Data: Indicating compliance with Quality Assurance Article.

C. Product Data: Provide properties of primer, bitumen, mastics and accessory materials.

D. Manufacturer's Installation Instructions: Indicate special procedures and perimeter conditions requiring special attention.

1.04 QUALITY ASSURANCE

A. Installer Qualifications: Company specializing in performing the work of this section with minimum five years experience.

1.05 FIELD CONDITIONS

A. Maintain ambient temperatures above 40 degrees F for 24 hours before and during application until dampproofing has cured.

PART 2 PRODUCTS

2.01 DAMPPROOFING PRODUCTS

A. General: Provide asphalt and solvent compound, mixed to smooth, uniform consistency to provide a firm, moisture-resistant, vapor resistant, elastic coating. Recommended for use as dampproofing by the manufacturer, and complying with one of the following systems.

B. Bituminous Dampproofing: Cold-applied water-based emulsion; asphalt with mineral colloid or chemical emulsifying agent; with or without fiber reinforcement; asbestos-free; suitable for application on vertical and horizontal surfaces.
   1. Composition - Vertical Application: ASTM D 1227 Type III or ASTM D 1187 Type I.
   2. Composition - Horizontal and Low-Slope Application: ASTM D 1227 Type II or III.
   3. VOC Content: Not more than permitted by local, State, and federal regulations.
   4. Applied Thickness: 1/16 inch, minimum, wet film.
   5. Products: Subject to compliance with requirements, products that may be incorporated in the Work include, but are not limited to, the following:
      a. #788, Henry Co.
      b. Karnak #920AF, Karnak Chemical Corp.
      c. Moisture Block 361, Mar-Flex Systems Inc.
      d. EF-7 Clippership, Seaboard Asphalt Products Co.
      e. Sealmastic Emulsion Type I, W.R. Meadows, Inc.
      f. Substitutions: See General Conditions.

C. Bituminous Dampproofing: Cold-applied, spray-grade; asphalt base, volatile petroleum solvents, and other content, suitable for application by spray, brush, roller, or squeegee; asbestos-free; suitable for application on vertical and horizontal surfaces.
   1. Composition: ASTM D 4479 Type I, minimum.

2. VOC Content: Not more than permitted by local, State, and federal regulations.
3. Applied Thickness: 1/16 inch, minimum, wet film.
4. Products: Subject to compliance with requirements, products that may be incorporated in the Work include, but are not limited to, the following:
   a. Karnak #229AF, Karnak Chemical Corp.
   b. Seaboard Fiber Roof Coating, Seaboard Asphalt Products Co.
   c. W.R. Meadows, Inc.; Sealmastic Spray-Mastic.
   d. Substitutions: See General Conditions.

D. Bituminous Dampproofing: Cold-applied, trowel-grade; asphalt base, volatile petroleum solvents, and other content, suitable for application by trowel on vertical and horizontal surfaces.
1. Composition: ASTM D 4586 Type I, minimum.
2. VOC Content: Not more than permitted by local, State, and federal regulations.
3. Applied Thickness: 1/16 inch, minimum, wet film.
4. Products: Subject to compliance with requirements, products that may be incorporated in the Work include, but are not limited to, the following:
   a. #793, Henry Co.
   b. Karnak #229AF, Karnak Chemical Corp.
   c. W.R. Meadows, Inc.; Sealmastic Trowel-Mastic.
   d. Substitutions: See General Conditions.

E. Primers, Mastics, and Related Materials: Type as recommended by dampproofing manufacturer.

2.02 ACCESSORIES

A. Glass-Fiber Mat: Nonwoven fiberglass fabric of continuous filament or jack-straw filament/yarn pattern of glass fiber, weighing 1.0 to 1.5 lbs. per 100 sq. ft., 36-inch-wide rolls.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions before starting work.

B. Verify substrate surfaces are durable, free of matter detrimental to adhesion or application of dampproofing system.

C. Verify that items that penetrate surfaces to receive dampproofing are securely installed.

3.02 PREPARATION

A. Protect adjacent surfaces not designated to receive dampproofing.

B. Clean and prepare surfaces to receive dampproofing in accordance with manufacturer's instructions.

C. Do not apply dampproofing to surfaces unacceptable to manufacturer.

D. Apply mastic to seal penetrations, small cracks, or minor honeycomb in substrate, and apply bond breakers, if any, as recommended by primer materials manufacturer, with particular attention at construction joints.

E. Install separate flashings and corner protection stripping, as recommended by primer materials manufacturer, where indicated to precede application of dampproofing.

F. Prime substrate as recommended by primer materials manufacturer.

3.03 APPLICATION

A. Comply with manufacturer's recommendations except where more stringent requirements are indicated and where Project conditions require extra precautions to ensure satisfactory performance of work.

B. General: Apply dampproofing to exterior surface of inside wythe of double-wythe, exterior masonry walls above grade.

C. Perform work in accordance with NRCA Roofing and Waterproofing Manual.

D. Prime surfaces in accordance with manufacturer's instructions.

E. Exterior Side of above grade masonry walls: Apply two coats of asphalt dampproofing.

F. Below Grade Walls: Apply vertical dampproofing down walls from finished-grade line to top of footing, extend over top of footing, and down a minimum of 6 inches over outside face of footing. Extend 12 inches onto intersecting walls and footings, but do not extend onto surfaces exposed to view.

G. Brush or spray apply first coat of dampproofing to produce a uniform, dry-film thickness of not less than 12 mils.

H. Apply second coat after allowing 24 hours for first coat to dry. Apply double thickness of second coat where first coat has failed to produce a smooth, shiny, impervious coat.

I. Reinforcement: At changes in plane or where otherwise shown as "reinforced," install lapped course of glass fabric in first coat of dampproofing compound before it thickens.

J. Bituminous Cant Strips: Install 2-by-2-inch cant strip of bituminous grout at base of vertical dampproofing where it meets horizontal surface.

K. Seal items projecting through dampproofing surface with mastic. Seal watertight.

3.04 PROTECTION AND CLEANING

A. Protect below grade dampproofing membrane from damage until backfill is completed.

B. Remove overspray and spilled materials from adjacent surfaces.

END OF SECTION

SECTION 07 1113
BITUMINOUS DAMPPROOFING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Bituminous dampproofing.

1.02 RELATED REQUIREMENTS

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

B. Section 04 2000 - Unit Masonry: Unit masonry foundation walls below grade.

1.03 SUBMITTALS

A. See General and Supplementary General Conditions for submittal procedures.

B. Qualification Data: Indicating compliance with Quality Assurance Article.

C. Product Data: Provide properties of primer, bitumen, mastics and accessory materials.

D. Manufacturer's Installation Instructions: Indicate special procedures and perimeter conditions requiring special attention.

1.04 QUALITY ASSURANCE

A. Installer Qualifications: Company specializing in performing the work of this section with minimum five years experience.

1.05 FIELD CONDITIONS

A. Maintain ambient temperatures above 40 degrees F for 24 hours before and during application until dampproofing has cured.

PART 2 PRODUCTS

2.01 DAMPPROOFING PRODUCTS

A. General: Provide asphalt and solvent compound, mixed to smooth, uniform consistency to provide a firm, moisture-resistant, vapor resistant, elastic coating. Recommended for use as dampproofing by the manufacturer, and complying with one of the following systems.

B. Bituminous Dampproofing: Cold-applied water-based emulsion; asphalt with mineral colloid or chemical emulsifying agent; with or without fiber reinforcement; asbestos-free; suitable for application on vertical and horizontal surfaces.
   1. Composition - Vertical Application: ASTM D 1227 Type III or ASTM D 1187 Type I.
   2. Composition - Horizontal and Low-Slope Application: ASTM D 1227 Type II or III.
   3. VOC Content: Not more than permitted by local, State, and federal regulations.
   4. Applied Thickness: 1/16 inch, minimum, wet film.
   5. Products: Subject to compliance with requirements, products that may be incorporated in the Work include, but are not limited to, the following:
      a. #788, Henry Co.
      b. Karnak #920AF, Karnak Chemical Corp.
      c. Moisture Block 361, Mar-Flex Systems Inc.
      d. EF-7 Clippership, Seaboard Asphalt Products Co.
      e. Sealmastic Emulsion Type I, W.R. Meadows, Inc.
      f. Substitutions: See General Conditions.

C. Bituminous Dampproofing: Cold-applied, spray-grade; asphalt base, volatile petroleum solvents, and other content, suitable for application by spray, brush, roller, or squeegee; asbestos-free; suitable for application on vertical and horizontal surfaces.
   1. Composition: ASTM D 4479 Type I, minimum.

2. VOC Content: Not more than permitted by local, State, and federal regulations.
3. Applied Thickness: 1/16 inch, minimum, wet film.
4. Products: Subject to compliance with requirements, products that may be incorporated in the Work include, but are not limited to, the following:
   a. Karnak #229AF, Karnak Chemical Corp.
   b. Seaboard Fiber Roof Coating, Seaboard Asphalt Products Co.
   c. W.R. Meadows, Inc.; Sealmastic Spray-Mastic.
   d. Substitutions: See General Conditions.

D. Bituminous Dampproofing: Cold-applied, trowel-grade; asphalt base, volatile petroleum solvents, and other content, suitable for application by trowel on vertical and horizontal surfaces.
1. Composition: ASTM D 4586 Type I, minimum.
2. VOC Content: Not more than permitted by local, State, and federal regulations.
3. Applied Thickness: 1/16 inch, minimum, wet film.
4. Products: Subject to compliance with requirements, products that may be incorporated in the Work include, but are not limited to, the following:
   a. #793, Henry Co.
   b. Karnak #229AF, Karnak Chemical Corp.
   c. W.R. Meadows, Inc.; Sealmastic Trowel-Mastic.
   d. Substitutions: See General Conditions.

E. Primers, Mastics, and Related Materials: Type as recommended by dampproofing manufacturer.

2.02 ACCESSORIES

A. Glass-Fiber Mat: Nonwoven fiberglass fabric of continuous filament or jack-straw filament/yarn pattern of glass fiber, weighing 1.0 to 1.5 lbs. per 100 sq. ft., 36-inch-wide rolls.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions before starting work.

B. Verify substrate surfaces are durable, free of matter detrimental to adhesion or application of dampproofing system.

C. Verify that items that penetrate surfaces to receive dampproofing are securely installed.

3.02 PREPARATION

A. Protect adjacent surfaces not designated to receive dampproofing.

B. Clean and prepare surfaces to receive dampproofing in accordance with manufacturer's instructions.

C. Do not apply dampproofing to surfaces unacceptable to manufacturer.

D. Apply mastic to seal penetrations, small cracks, or minor honeycomb in substrate, and apply bond breakers, if any, as recommended by primer materials manufacturer, with particular attention at construction joints.

E. Install separate flashings and corner protection stripping, as recommended by primer materials manufacturer, where indicated to precede application of dampproofing.

F. Prime substrate as recommended by primer materials manufacturer.

3.03 APPLICATION

A. Comply with manufacturer's recommendations except where more stringent requirements are indicated and where Project conditions require extra precautions to ensure satisfactory performance of work.

B. General: Apply dampproofing to exterior surface of inside wythe of double-wythe, exterior masonry walls above grade.

C. Perform work in accordance with NRCA Roofing and Waterproofing Manual.

D. Prime surfaces in accordance with manufacturer's instructions.

E. Exterior Side of above grade masonry walls: Apply two coats of asphalt dampproofing.

F. Below Grade Walls: Apply vertical dampproofing down walls from finished-grade line to top of footing, extend over top of footing, and down a minimum of 6 inches over outside face of footing. Extend 12 inches onto intersecting walls and footings, but do not extend onto surfaces exposed to view.

G. Brush or spray apply first coat of dampproofing to produce a uniform, dry-film thickness of not less than 12 mils.

H. Apply second coat after allowing 24 hours for first coat to dry. Apply double thickness of second coat where first coat has failed to produce a smooth, shiny, impervious coat.

I. Reinforcement: At changes in plane or where otherwise shown as "reinforced," install lapped course of glass fabric in first coat of dampproofing compound before it thickens.

J. Bituminous Cant Strips: Install 2-by-2-inch cant strip of bituminous grout at base of vertical dampproofing where it meets horizontal surface.

K. Seal items projecting through dampproofing surface with mastic. Seal watertight.

3.04 PROTECTION AND CLEANING

A. Protect below grade dampproofing membrane from damage until backfill is completed.

B. Remove overspray and spilled materials from adjacent surfaces.

END OF SECTION

SECTION 07 2100
THERMAL INSULATION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Board insulation in exterior wall construction.

B. Board insulation in roof assembly.

C. Batt insulation in exterior wall construction.

D. Batt insulation for filling perimeter shim spaces and crevices in exterior wall and roof.

1.02 RELATED REQUIREMENTS

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

B. Section 04 2000 - Unit Masonry: Installation of cavity wall insulation.

C. Section 05 4000 - Cold-Formed Metal Framing: Supporting construction for batt insulation.

D. Section 07 2500 - Weather Barriers: Separate air barrier and vapor retarder materials.

1.03 SUBMITTALS

A. See General and Supplementary General Conditions for submittal procedures.

B. Product Data: Provide data on product characteristics, performance criteria, and product limitations.

C. Manufacturer's Installation Instructions: Include information on special environmental conditions required for installation and installation techniques.

1.04 FIELD CONDITIONS

A. Do not install insulation adhesives when temperature or weather conditions are detrimental to successful installation.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Substitutions: See General and Supplementary General Conditions.

B. Extruded Polystyrene Board Insulation: Subject to compliance with requirements, manufacturers offering products that may be incorporated in the Work include, but are not limited to, the following:
   1. Dow Chemical Co.
   2. Owens Corning Corp.
   3. Pactiv Building Products.

C. Polyisocyanurate Board Insulation: Subject to compliance with requirements, manufacturers offering products that may be incorporated in the Work include, but are not limited to, the following:
   1. Atlas Roofing Corporation.
   2. Dow Chemical Co.
   3. GAF Materials Corporation.

D. Batt Insulation: Subject to compliance with requirements, manufacturers offering products that may be incorporated in the Work include, but are not limited to, the following:
   1. CertainTeed Corporation.
   2. Johns Manville Corporation.
   3. Knauf Insulation GmbH.
   4. Owens Corning Corp.

2.02 APPLICATIONS

A. Insulation Inside Masonry Cavity Walls: Extruded polystyrene board.

B. Insulation in Metal Framed Walls: Batt insulation with integral vapor retarder.

C. Insulation in Roof Assembly: Polyisocyanurate board.

2.03 FOAM BOARD INSULATION MATERIALS

A. Extruded Polystyrene Board Insulation: ASTM C 578, Type IV; unless otherwise noted. Type V in below grade applications. Extruded polystyrene board with natural skin surfaces; with the following characteristics:
   1. Flame Spread Index: 75 or less, when tested in accordance with ASTM E 84.
   2. Smoke Developed Index: 450 or less, when tested in accordance with ASTM E 84.
   3. Board Size: 48 x 96 inch.
   4. Board Thickness: As indicated on the Drawings.
   5. Board Edges: Square.
   6. Thermal Conductivity (k factor) at 25 degrees F: 0.18.
   7. Compressive Resistance: 25 psi. unless otherwise noted.
   8. Compressive Resistance, below grade applications: 100 psi.
   9. Board Density: 1.6 lb/cu ft. unless otherwise noted.
   10. Board Density, below grade applications: 3.0 lb/cu ft.
   11. Water Absorption, maximum: 0.3 percent, volume.

B. Polyisocyanurate Board Insulation: Rigid cellular foam, complying with ASTM C 1289; Type II, Class 1, cellulose felt or glass fiber mat both faces, Grade 2.
   1. Flame Spread Index: 75 or less, when tested in accordance with ASTM E 84.
   2. Smoke Developed Index: 450 or less, when tested in accordance with ASTM E 84.
   3. Board Size: 48 x 96 inch.
   4. Board Edges: Square.
   5. Compressive Strength: 20 psi
   6. Thermal Resistance: LTTR-value of 5.7 per inch, minimum.
   7. Thickness: As required to provide R-30.

2.04 BATT INSULATION MATERIALS

A. Glass Fiber Batt Insulation: Flexible preformed batt or blanket, complying with ASTM C 665; friction fit.
   1. Flame Spread Index: 25 or less, when tested in accordance with ASTM E 84.
   2. Smoke Developed Index: 50 or less, when tested in accordance with ASTM E 84.
   3. Combustibility: Non-combustible, when tested in accordance with ASTM E 136, except for facing, if any.
   4. Formaldehyde Content: Zero.
   5. Thermal Resistance: R of R-19.
   6. Facing: foil-scrim-kraft or foil-scrim-polyethylene vapor retarder membrane on one face.
   7. Facing: Aluminum foil, one side.

2.05 ACCESSORIES

A. Sheet Vapor Retarder: Specified in Section 07 2500.

B. Insulation Fasteners: Impaling clip of unfinished steel with washer retainer and clips, to be adhered to surface to receive insulation, length to suit insulation thickness and substrate, capable of securely and rigidly fastening insulation in place.

C. Nails or Staples: Steel wire; electroplated or galvanized; type and size to suit application.

D. Adhesive: Type recommended by insulation manufacturer for application.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that substrate, adjacent materials, and insulation materials are dry and that substrates are ready to receive insulation and adhesive.

B. Verify substrate surfaces are flat, free of honeycomb, fins, irregularities, or materials or substances that may impede adhesive bond.

3.02 BOARD INSTALLATION AT CAVITY WALLS

A. Installation by masons, as specified in Section 04 2000 “Unit Masonry.”

3.03 BOARD INSTALLATION AT ROOFS

A. Attachment of Insulation: Mechanically fasten insulation to deck in accordance with roofing manufacturer's instructions, but in no case provide less than one anchor per 4 sq. ft. of surface area or less anchorage than required by FM Loss Prevention Data Sheet 1-28.

B. Lay subsequent layers of insulation with joints staggered minimum 6 inch from joints of preceding layer.

C. Lay boards with edges in moderate contact without forcing. Cut insulation to fit neatly to perimeter blocking and around penetrations through roof.

D. Tape joints of insulation in accordance with roofing and insulation manufacturers' instructions.

3.04 BATT INSTALLATION

A. Install insulation in accordance with manufacturer's instructions.

B. Install in exterior wall where shown without gaps or voids. Do not compress insulation.

C. Trim insulation neatly to fit spaces. Insulate miscellaneous gaps and voids.

D. Fit insulation tightly in cavities and tightly to exterior side of mechanical and electrical services within the plane of the insulation.

E. Install with factory applied vapor retarder membrane facing warm side of building spaces. Lap ends and side flanges of membrane over framing members.

F. Tape insulation batts in place.

G. Tape seal butt ends, lapped flanges, and tears or cuts in membrane.

3.05 PROTECTION

A. Do not permit installed insulation to be damaged prior to its concealment.

END OF SECTION

SECTION 07 2500
WEATHER BARRIERS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Air Barriers.

B. Synthetic Roofing Underlayment.

1.02 RELATED REQUIREMENTS

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

B. Section 01 7800 - Closeout Submittals.

C. Section 04 2000 - Unit Masonry: Embedded flashings installed in masonry construction.

D. Section 07 1113 - Bituminous Dampproofing.

E. Section 07 6200 - Sheet Metal Flashing and Trim: Fabricated sheet metal flashing, sill pans.

F. Section 07 9000 - Joint Sealers: Sealant materials and installation techniques.

1.03 DEFINITIONS

A. Weather Barrier: Assemblies that form either water-resistive barriers, air barriers, or vapor retarders. Capable of performing as a continuous liquid-water drainage plane flashed to discharge incidental condensation or water penetration to the exterior. Capable of accommodating substrate movement and of sealing substrate expansion and control joints, construction material changes, and transitions at perimeter conditions without deterioration and air leakage exceeding specified limits.

B. Water-Resistive Barrier: Water-shedding barrier made of material that is moisture-resistant, to the degree specified, intended to be installed to shed water without sealed seams.

C. Air Barrier: Air tight barrier made of material that is relatively air impermeable but water vapor permeable, both to the degree specified, with sealed seams and with sealed joints to adjacent surfaces. Note: For the purposes of this specification, vapor impermeable air barriers are classified as vapor retarders.

D. Vapor Retarder: Air tight barrier made of material that is relatively water vapor impermeable, to the degree specified, with sealed seams and with sealed joints to adjacent surfaces.

E. Water Vapor Permeance: For purposes of conversion, 57.2 ng/(Pa s sq m) = 1 perm.

1.04 SUBMITTALS

A. See General and Supplementary General Conditions for submittal procedures.

B. Product Data: Provide data on material characteristics for each component of weather barrier system, demonstrating compliance with requirements.

C. Qualification Data: Indicating compliance with Quality Assurance Article.

D. Specimen Warranty.

E. Manufacturer's Installation Instructions: Indicate preparation.

F. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

1.05 QUALITY ASSURANCE

A. Source Limitations: Obtain primary air barrier or vapor retarder material, plus associated flashings and membranes, from a single source. Where both types of systems are specified, provide systems from a single source or submit certification of compatibility.

1.06 DELIVERY, STORAGE AND HANDLING

A. Deliver materials in labeled packages. Store and handle in compliance with manufacturer's instructions, recommendations, and material safety data sheets.

B. Protect materials from damage from sunlight, weather, excessive temperatures and construction operations. Protect fluid applied materials from freezing and excessive heat.

1.07 FIELD CONDITIONS

A. Apply weather barrier systems within the range of ambient and substrate temperatures recommended by barrier manufacturer. Protect substrates from environmental conditions that affect performance of the barrier. Do not apply barrier to wet substrate, or during rain, snow, fog or mist.

1.08 WARRANTY

A. Submit warranty, executed by manufacturer of primary weather barrier manufacturer, agreeing to replace materials that fail in materials or workmanship.
   1. Warranty Period: Five years from date of Final Acceptance of the work or Beneficial Occupancy.

PART 2 PRODUCTS

2.01 WEATHER BARRIER ASSEMBLIES

A. General: Provide all accessories, including transition membranes, flexible flashings and primers, adhesives, sealants and accessories recommended by manufacturer of primary weather barriers to create a complete, compatible system. Materials shall be specifically approved by membrane manufacturer for use on substrates present in the Project.

B. Air Barrier: Materials that form a vapor-permeable system to stop passage of air through exterior walls, joints between exterior walls and roof, and joints around frames of openings in exterior walls.
   1. On outside surface of sheathing at exterior walls use air barrier sheet, mechanically fastened type.

2.02 AIR BARRIER MATERIALS (WATER VAPOR PERMEABLE AND WATER-RESISTIVE)

A. Provide specified air barrier, along with all associated components recommended by manufacturer to provide a complete system capable of performing as a continuous vapor-permeable air barrier.

B. Air Barrier Sheet, Mechanically Fastened: Spun-bonded polyolefin, non-woven, non-perforated.
   1. Air Permeance: ASTM E2178, 0.004 cfm per square foot, maximum at 1.57 psf.
   2. Water Vapor Permeance: ASTM E96 Procedure A, 20 perms, minimum.
   3. Water Resistance: AATCC Test Method 127, 55 cm head for 5 hours, no leakage.
   4. Water Resistance: Comply with applicable water-resistive requirements of ICC-ES Acceptance Criteria AC38.
   5. Tensile Strength: ASTM D882, 38 lbs. MD, 23 lbs. CD.
   6. Ultraviolet and Weathering Resistance: Approved in writing by manufacturer for minimum of 9 months weather exposure.
   7. Surface Burning Characteristics: ASTM E84, Class A. Flame spread index of 25 or less, smoke developed index of 450 or less.
   8. Available Products: Subject to compliance with requirements, products which may be incorporated in the Work include, but are not limited to:
      a. DuPont Company; Tyvek CommercialWrap.
      b. Pactiv Corporation; GreenGuard C2000 Building Wrap.
      c. VaproShield USA; WrapShield.
      d. Substitutions: See General Conditions.

2.03 SYNTHETIC ROOFING UNDERLAYMENT

A. Underlayment: Polyolefin-based, non-asphaltic reinforced sheet membrane with anti-slip coating both sides. Designed for mechanical attachment to roofing substrates without sealed seams. ICC approved alternate to ASTM Type I and Type II felt.
   1. Minimum Thickness: 25 mils.
   2. Fire Performance: ASTM E108, Class A.
   3. UV Resistance: Approved in writing by manufacturer for minimum 6 months exposure to weather.
   4. Self-Sealability: ASTM D1970, pass.
   5. Water Vapor Permeance: ASTM E96, 0.06 perm, maximum.
   6. Water Transmission: ASTM D4869, pass.
   7. Tear Strength: ASTM D4533, MD 40 lbs.
   8. Tensile Strength: ASTM D751, MD 154 lbs, minimum.
   9. Burst Strength: ASTM D751, 250 psi.
   10. Elongation: ASTM D751, MD 18%, CD 18%.

B. Available Products: Subject to compliance with requirements, products which may be incorporated in the Work include, but are not limited to:
   1. Grace Construction Products, Grace Basik.
   2. Intertape Polymer Group, Nova-Seal Premium.
   3. InterWrap, Inc., Titanium UDL-25 Plus.
   4. Substitutions: See General Conditions.

2.04 MEMBRANE FLASHING

A. General: Provide flashings from manufacturer of primary weather barrier material, compatible with weather barrier materials and adjacent construction.

B. Where specifically approved for use by weather barrier sheet membrane manufacturer, flexible flashing may consist of product with physical characteristics identical to primary weather barrier sheet membrane.

C. Flexible Flashing: Fluid-applied flexible flashing designed for use as a transition membrane.

D. Flexible Flashing: Self-adhered, water-resistive flexible sheet flashing designed for use as a transition membrane, consisting of rubberized asphalt integrally bonded to cross-laminated, high density polyethylene film.
   1. Thickness: 30 mil (0.030 inch), minimum.
   2. Width: Manufacturer's standard widths to suit Project conditions.
   3. Water Vapor Permeance: ASTM E96, 0.05 perm, maximum.
   4. Puncture Resistance: ASTM E154, 40 lbs. minimum.
   5. Lap Adhesion: ASTM D1876, 5.0 lbs per inch of width.
   6. Tensile Strength: ASTM D412, 400 psi.
   7. Elongation: ASTM D412, minimum 200%.
   8. Low Temperature Flexibility: Comply with ASTM D1970.

E. Aluminized Flexible Flashing: Self-adhered, water-resistive flexible flashing consisting of rubberized asphalt integrally bonded to aluminum film.
   1. Thickness: 40 mil (0.040 inch), nominal.
   2. Width: Manufacturer's standard widths to suit Project conditions.
   3. Water Absorption: ASTM D570, 0.1% by weight, maximum.
   4. Puncture Resistance: ASTM E154, 80 lbs. minimum.
   5. Lap Adhesion: ASTM D1876, 5.0 lbs per inch of width.
   6. Tensile Strength: ASTM D412, 600 psi.
   7. Elongation: ASTM D412, minimum 200%.
   8. Low Temperature Flexibility: Comply with ASTM D1970.

2.05 SEALANTS

A. Joint Sealants: As specified in Section 07 9000 and fully compatible with weather barrier materials.

B. Penetration and Termination Sealant: Elastomeric trowel-grade coating, as recommended by weather barrier manufacturer, appropriate to applications and compatible with adjacent materials.

C. Sealant Backers: As specified in Section 07 9000 and compatible with weather barrier materials.

2.06 ADHESIVES

A. Adhesives: Compatible with sheet seal and substrate, as recommended by manufacturer of primary weather barrier materials.

B. Mastic Adhesive: Compatible with sheet seal and substrate, thick mastic of uniform knife grade consistency.

C. Non-Curing Adhesive: Compatible with sheet seal and substrate, permanently non-curing.

2.07 ACCESSORIES

A. Fasteners for Mechanically Fastened Weather Barriers: Corrosion resistant type, recommended by membrane manufacturer for use in specified substrates.

B. Fasteners for Roofing Underlayment: Hot-dipped zinc coated steel roofing nail, headed or with plastic cap, or roofing staple fasteners with minimum 1 inch diameter plastic cap.

C. Primers: Water based, as recommended by weather barrier material manufacturer for Project substrates.

D. Substrate Patching Membrane: Elastomeric trowel-grade coating, as recommended by weather barrier manufacturer for use with Project substrates.

E. Sheathing Tape: As recommended by weather barrier manufacturer for the substrate.

F. Thinners and Cleaners: As recommended by weather barrier material manufacturer and compatible with adjacent materials.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that substrates and conditions are ready to accept the work of this section.

B. Fill voids, gaps and spalled areas in substrate to provide an even plane.

C. Examination of Roof:
   1. Verify that roof sheathing is of sufficient thickness to accept fasteners.
   2. Verify that roof openings are correctly framed, roofing penetrations and stacks are in place.
   3. Verify roof deck surfaces are dry, free of warps and voids.

3.02 PREPARATION

A. Comply with manufacturer’s requirements for preparation of substrates.

B. Remove projections, protruding fasteners, and loose or foreign matter that might interfere with proper installation. Remove contaminants such as grease, oil and wax from exposed surfaces. Remove dust, dirt, loose stone and debris.

C. Clean and prime substrate surfaces to receive weather barrier components in accordance with manufacturer's instructions. Limit priming to surfaces that will be covered in the same day. Re-prime areas exposed for more than 24 hours.

D. At changes in substrate plane, fill or tape joints as recommended by barrier manufacturer to provide smooth transition from one plane to another. Cover gaps in substrate planes as

recommended by barrier manufacturer. Do not bridge building expansion joints with rigid covering material; attach covering at one side of joint only.

E. Prepare inside and outside corners with flexible flashing as recommended.

3.03 INSTALLATION, GENERAL

A. Where manufacturer's recommendations differ from written specifications, comply with most stringent instructions.

B. Install materials in accordance with manufacturer's recommendations. Connect and seal exterior weather barrier membrane continuously to roofing membrane weather barrier, concrete below-grade structures, floor-to floor construction, exterior glazing and window systems, glazed curtain-wall systems, storefront systems, exterior louvers, exterior door framing, and other construction used in exterior wall openings, using accessory materials indicated.
   1. Air Barriers: Install continuous airtight barrier over surfaces indicated, with sealed seams and with sealed joints to adjacent surfaces.

C. Apply sealants, primers and adhesives within recommended application temperature ranges. Consult manufacturer if temperature is out of this range.

3.04 WEATHER BARRIER MEMBRANE INSTALLATION

A. Mechanically Fastened Sheets - On Exterior:
   1. Install sheets shingle-fashion to shed water, with seams generally horizontal.
   2. Overlap seams as recommended by manufacturer but at least 6 inches.
   3. Overlap at outside and inside corners as recommended by manufacturer but at least 12 inches.
   4. Attach to framed construction with fasteners extending through sheathing into framing. Space fasteners at 12 to 18 inches on center along each framing member supporting sheathing.
   5. Seal seams, laps, penetrations, tears, and cuts with self-adhesive tape; use only large-headed, gasketed fasteners recommended by the manufacturer.
   6. Where stud framing rests on concrete or masonry, extend lower edge of sheet at least 4 inches below bottom of framing and seal to foundation with sealant.
   7. Install air barrier UNDER jamb flashings.
   8. Install head flashings under weather barrier.
   9. At openings to be filled with frames having nailing flanges, wrap excess sheet into opening; at head, seal sheet over flange and flashing.

3.05 INSTALLATION OF FLEXIBLE FLASHING

A. Install flexible flashings and sealants according to manufacturer's instructions to form a seal with adjacent construction and maintain a continuous weather barrier.

B. Coordinate installation of flashings with window, louver and door installation.

C. Trim back weather barrier at opening perimeter as directed, and prime exposed substrates as required.

D. Provide lap seams to shed water. Roll lap seams to ensure adhesion.

E. Install flexible flashing over sills, covering entire sill frame member, extending at least 5 inches onto weather barrier and at least 6 inches up jambs; mechanically fasten stretched edges.

F. At openings to be filled with frames having nailing flanges, seal head and jamb flanges using a continuous bead of sealant compressed by flange and cover flanges with at least 4 inches wide; do not seal sill flange.

G. At openings to be filled with non-flanged frames, install aluminized flexible flashing around perimeter of opening, to accommodate placement of backer rod and sealant between window frame and weather barrier membrane. Seal weather barrier to all sides of opening framing, using flashing at least 9 inches wide, covering entire depth of framing.

H. At head of openings, install flexible flashing under weather barrier extending at least 2 inches beyond face of jambs; seal weather barrier to flashing.

I. Install preformed corners into corners of prepared openings over flashing membrane, or lap flexible flashing strips per manufacturer's instructions. Secure and seal to weather barrier.

J. At interior face of openings, seal gap between window/door frame and rough framing, using joint sealant over backer rod.

K. Service and Other Penetrations: Form flashing around penetrating item and seal to weather barrier surface.

3.06 INSTALLATION OF ROOFING UNDERLAYMENT

A. Comply with manufacturer's recommendations, and all requirements of code bodies having jurisdiction. Where these instructions differ from written specifications, comply with most stringent requirements.

B. Prepare roof substrate per manufacturer's instructions. Coordinate with installation of roof water and ice barrier.

C. Install underlayment so that all laps shed water. Always work from low point to high point of the roof.

D. Starting at lowest point of the roof section, apply one layer of roofing underlayment horizontally over all sections of roof deck not protected by eave or valley roof water and ice barrier, and secure in place. Lap horizontal edges 2 inches. Overlap ends at least 4 inchers; stagger end laps at least 36 inches apart.

E. Rake Edges: Apply roofing underlayment prior to installing rake edge flashing. Apply sealant to edge prior to installation of metal flashing, and attach edge flashing every 6 inches.

F. Vent Pipes and Field Penetrations: Apply a 24 inch square sheet of roofing underlayment around the penetration. Lap over underlayment beneath and at sides of penetration, and over underlayment above the penetration. Apply sealant to the seam above the penetration.

3.07 FIELD QUALITY CONTROL

A. Do not cover installed weather barriers until required inspections have been completed.

B. Review condition of weather barrier prior to installation of cladding or veneer. Repair punctures, damaged areas and inadequately lapped seams per manufacturer's recommendations. Remove and replace deficient weather barrier components, including areas damaged by chemical spills or surfactants.

3.08 PROTECTION

A. Protect weather barrier system from damage during application and remainder of construction period.

B. Do not leave materials exposed to weather longer than recommended by manufacturer.

C. Do not leave paper- or felt-based barriers exposed to weather for longer than one week.

D. Remove masking materials after installation.

E. Clean spills, stains and soiling from adjacent construction that would be exposed in the completed work, using cleaning agents and procedures recommended by manufacturers of the affected components.

END OF SECTION

SECTION 07 4113
METAL ROOF PANELS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Standing seam roof panels.

B. Gutters and downspouts.

C. Metal flashings associated with and adjacent to roof and fascia systems.

D. Fastening system.

E. Accessories and miscellaneous components.

1.02 RELATED REQUIREMENTS

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

B. Section 01 7800 - Closeout Submittals.

C. Division 5 Sections for structural framing.

D. Section 07 2100 - Thermal Insulation: Rigid insulation associated with roof assembly.

E. Section 07 2500 - Weather Barriers: Synthetic roofing underlayment.

F. Section 07 6200 - Sheet Metal Flashing and Trim: Soffit Panels.

G. Section 07 7100 - Roof Specialties: Snow management systems.

H. Section 07 7100 - Roof Specialties: Pipe and penetration flashings to be installed under this section.

1.03 SUBMITTALS

A. See General and Supplementary General Conditions for submittal procedures.

B. Qualification Data: Indicating compliance with Quality Assurance Article.

C. Product Data: Manufacturer's data sheets on each product to be used, including:
   1. Summary of certified test results, indicating compliance with specified requirements.
   2. Storage and handling requirements and recommendations.
   3. Installation methods.
   4. Typical installation details.

D. Specimen Warranty.

E. Shop Drawings: Include layouts of roof panels, details of edge and penetration conditions, joints, corners, supports, anchorages, spacing and type of connections, flashings and closures, underlayments, and special conditions. Distinguish between factory and field assembly work.
   1. Show work to be field-fabricated or field-assembled.
   2. Include structural analysis signed and sealed by qualified structural engineer, indicating conformance of roofing system to specified loading conditions.

F. Selection Samples: For each roofing system specified, submit color chips representing manufacturer's full range of available colors and patterns.

G. Installer Warranty: Submit specified warranty and ensure that forms have been completed in Owner's name.

H. Manufacturer Warranty: Submit specified manufacturer's warranty and ensure that forms have been completed in Owner's name and are registered with manufacturer.
   1. Manufacturer’s Certification: Certify that all materials documenting roof conditions which are required in order to fulfill the terms of the warranty have been delivered by the installer to the manufacturer and approved as complete.

1.04 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in the manufacture of roofing systems similar to those required for this project, with not less than 5 years of documented experience.

B. Installer Qualifications: Company trained and authorized by roofing system manufacturer.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Provide strippable plastic protection on prefinished roofing panels for removal after installation.

B. Handling: Exercise care in unloading, storing, and erecting wall and roof covering panels to prevent bending, warping, twisting, and surface damage.

C. Store roofing panels on project site as recommended by manufacturer to minimize damage to panels prior to installation. Store metal roof panels so that they will not accumulate water. Do not store panels with materials that might cause staining, denting, or other surface damage.

1.06 WARRANTY

A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.

B. Finish Warranty: Provide manufacturer's special warranty covering failure of factory-applied exterior finish on metal roof panels and agreeing to repair or replace panels that show evidence of finish degradation, including significant fading, chalking, cracking, or peeling within specified warranty period of 20 year period from date of Final Acceptance of the work or Beneficial Occupancy.

C. Installation Warranty: The Roofing Contractor shall warrant the materials and workmanship of the roofing system against leakage and against defects due to faulty materials, workmanship and contract negligence for a period of 2 years from date of Final Acceptance of the work or Beneficial Occupancy.

D. Waterproofing Warranty: Provide manufacturer's warranty for weathertightness of roofing system, including agreement to repair or replace roofing that fails to keep out water within specified warranty period of 20 years from date of Final Acceptance of the work or Beneficial Occupancy.

1. Required Certifications: Where terms of the warranty require documentation of roof conditions, either during roof installation, or upon completion of roof installation, provide manufacturer's certification that all such documentation has been delivered from the installer to the manufacturer, and that the submitted documentation fulfills the requirements of the warranty to the manufacturer's full satisfaction.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Subject to compliance with requirements, manufacturers offering products that may be incorporated in the Work include, but are not limited to, the following:

1. ATAS International, Inc.
2. Berridge Manufacturing Co.
3. Consolidated Systems, Inc.
4. Dimensional Metals, Inc.
5. McElroy Metal.
6. Metal Building Components, Inc. (MBCI).
7. Petersen Aluminum Corporation.
8. Triad Corrugated Metal, Inc.
9. Substitutions: See General Conditions.

2.02 ROOF PANELS

A. Performance Requirements: Provide complete roofing assemblies, including roof panels, clips, fasteners, connectors, and miscellaneous accessories, tested for conformance to the following minimum standards:
   1. Overall: Complete weathertight system tested and approved in accordance with ASTM E 1592.
   2. Wind Uplift: Class 90 wind uplift resistance per UL 580.
   3. Air Infiltration: Maximum 0.06 cfm/sq ft at air pressure differential of 6.24 lbf/sq ft, when tested according to ASTM E 1680.
   4. Water Penetration: No water penetration when tested according to procedures and recommended test pressures of ASTM E 1646. Perform test immediately following air infiltration test.
   5. Thermal Movement: Design system to accommodate without deformation anticipated thermal movement over ambient temperature range of 100 degrees F.

B. Metal Roofing: Factory-formed standing seam roof panels with factory-applied finish.
   1. Basis of Design: McElroy Metal Inc. “Maxima 2”, designed for attachment using a concealed clip.
   2. Steel Sheet:
      a. Aluminum-zinc alloy-coated SS (structural steel) sheet conforming to ASTM A 792/A 792M; AZ50 coating.
      b. Steel Grade: 50 ksi.
      c. Steel Thickness: Minimum 24 gauge (0.024 inch).
   3. Profile: Vertical leg standing seam, with minimum 2 inch seam height; concealed fastener system; for field seaming with special tool.
   4. Texture: Smooth, with intermediate striations for added stiffness.
   5. Length: Maximum possible length to minimize lapped joints.
   6. Width: Maximum panel coverage of 16 inches.

2.03 ATTACHMENT SYSTEM

A. Concealed System: Provide manufacturer's standard stainless steel concealed anchor clips designed for specific roofing system and engineered to meet performance requirements, including anticipated thermal movement.
   1. Panel Clips: 16-gage (0.0598-inch) steel.
   2. Cleats: Mechanically seamed cleats formed from 24-gage (0.0239-inch), Grade C, zinc-coated steel.

B. Fasteners: Self-tapping screws, bolts, nuts, self-locking rivets, self-locking bolts, end-welded studs, and other suitable fasteners designed to withstand design loads.
   1. Use aluminum, corrosion-resistant steel, or stainless steel fasteners for exterior application and galvanized or cadmium-plated fasteners for interior applications. Roof fasteners shall be furnished in sufficient lengths to extend through the roof insulation.
   2. Exposed fasteners where required shall match color of roof or wall panel by means of plastic caps or factory-applied coating.
   3. Use insulation washers between hold down clips and the insulation to prevent deformation of the insulation when clips are secured to the roof deck.

2.04 PANEL FINISH

A. Exterior Finish, Fluoropolymer Coating System: Manufacturer’s standard multi-coat thermocured coating system, including primer and minimum 70 percent fluoropolymer color topcoat. Minimum total dry film thickness of 0.9 mil, 30 percent reflective gloss when tested per ASTM D523. Provide coating that has been field tested under normal range of weathering conditions for minimum of 20 years without significant peel, blister, flake, chip, crack, or check in finish; without chalking in excess of No. 8 in accordance with ASTM D 659; and without fading in excess of 5 NBS units. Color and gloss to match sample.

B. Interior Finish: Manufacturer's standard primer coat and wash coat or acrylic or polyester backer finish, 0.5 mil total dry film thickness.

C. Colors: Colors to be selected by Architect from samples provided.

2.05 ACCESSORIES AND MISCELLANEOUS ITEMS

A. General: Except as indicated as work of another specification section, provide components required for a complete roof panel system, including trim, copings, fascias, gravel stops, mullions, sills, corner units, ridge closures, clips, seam covers, battens, flashings, gutters, louvers, sealants, gaskets, fillers, closure strips, and similar items.

B. Miscellaneous Sheet Metal Items: Provide flashings, gutters, downspouts, trim, moldings, closure strips, preformed crickets, caps, and equipment curbs of the same material, thickness, and finish as used for the roofing panels unless otherwise noted. Items completely concealed after installation may optionally be made of stainless steel.
   1. Gutters: Open face, rectangular profile, 24 gauge steel.
      a. Color: Colors to be selected by Architect from samples provided.
   2. Downspouts: Square profile, 22 gauge steel.
      a. Color: Colors to be selected by Architect from samples provided.

C. Rib and Ridge Closures: Provide prefabricated, close-fitting components of steel with corrosion resistant finish, closed-cell synthetic rubber, neoprene, or PVC, or combination steel and closed-cell foam.

D. Sealants: One-part elastomeric polyurethane, polysulfide, or silicone rubber sealant as recommended by the building manufacturer and as specified in Section 07 9000.
   1. Exposed sealant must cure to rubber-like consistency.
   2. Concealed sealant must be non-hardening type.
   3. Seam sealant must be factory-applied, non-skinning, non-drying type.

E. Bituminous Coating: Cold applied mastic, SSPC paint 12, compounded for 15 mil dry film thickness per coat.

F. Pipe Penetration Flashings: As specified in Section 07 7100.

2.06 FABRICATION

A. Panels: Fabricate and finish panels and accessory items at factory to greatest extent possible, using manufacturer's standard processes as required to achieve specified appearance and performance requirements. Prior to fabrication of panels, take field measurements of structure or substrates to receive panel system. Allow for trimming panels where final dimensions cannot be established prior to fabrication.
   1. Portable roll formers are not permissible.

B. Joints: Factory-install captive gaskets, sealants, or separator strips at panel joints to provide weathertight seals, eliminate metal-to-metal contact, and minimize noise from panel movements.

C. Apply finish coatings either before or after forming and fabricating panels, as required by coating process and as required for maximum coating performance capability. Protect coating with strippable film or by packing suitable material between panels in a manner to properly protect the finish. Furnish air-drying spray finish in matching color for touch-up.

D. Apply bituminous coating or other permanent separation materials on concealed panel surfaces where panels would otherwise be in direct contact with substrate materials that are noncompatible or could result in corrosion or deterioration of either material or finishes.

PART 3 EXECUTION

3.01 EXAMINATION

A. Do not begin installation of preformed metal roof panels until substrates have been properly prepared.

B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.02 PREPARATION

A. Broom clean wood sheathing prior to installation of roofing system.

B. Coordinate roofing work with provisions for roof drainage, flashing, trim, penetrations, and other adjoining work to assure that the completed roof will be free of leaks.

C. Coordinate the installation of rigid insulation with Section 07 2100.

D. Coordinate installation of synthetic roofing underlayment with Section 07 2500.

E. Remove protective film from surface of roof panels immediately prior to installation. Strip film carefully, to avoid damage to prefinished surfaces.

F. Separate dissimilar metals by applying a bituminous coating, self-adhering rubberized asphalt sheet, or other permanent method approved by roof panel manufacturer.

G. Where metal will be in contact with wood or other absorbent material subject to wetting, seal joints with sealing compound and apply one coat of heavy-bodied bituminous paint.

3.03 INSTALLATION

A. Overall: Install roofing system in accordance with approved shop drawings and panel manufacturer's instructions and recommendations, as applicable to specific project conditions and substrates. Anchor all components of roofing system securely in place while allowing for thermal and structural movement.
   1. Install roofing system with concealed clips and fasteners, except as otherwise recommended by manufacturer for specific circumstances.
   2. Minimize field cutting of panels. Where field cutting is absolutely required, use methods that will not distort panel profiles. Use of torches for field cutting is absolutely prohibited.

B. Accessories: Install all components required for a complete roofing assembly, including flashings, gutters, downspouts, trim, moldings, closure strips, caps, rib closures, ridge closures, and similar roof accessory items.

C. Install weather barriers on roof deck before installing preformed metal roof panels. Secure by methods acceptable to roof panel manufacturer, minimizing use of metal fasteners. Apply from eaves to ridge in shingle fashion, overlapping horizontal joints a minimum of 2 inches and side and end laps a minimum of 3 inches. Offset seams in building paper and seams in roofing felt.

D. Roof Panels: Install panels in strict accordance with manufacturer’s instructions, minimizing transverse joints except at junction with penetrations.
   1. Form weathertight standing seams incorporating concealed clips, using an automatic mechanical seaming device approved by the panel manufacturer. Seal seams with double, 180 degree fold.
   2. Install clips at each support with self-drilling/self-tapping fasteners and insulation washers to prevent deformation of the roof insulation.

E. Secure flashings and claddings in place using concealed fasteners. Use exposed fasteners only where permitted.

F. Roof Edge Trim: Install roof edges with concealed metal clips. Clips shall be fabricated from same material and in same configuration as flashings to provide for snap down installation of flashings. Provide clips firmly anchored to nailers at 4 feet maximum on center.

G. Gutters and Downspouts: Anchor units of work securely in place by methods indicated, providing for thermal expansion of metal units; conceal fasteners where possible, and set units true to line and level as indicated. Install work with laps, joints, and seams that will be permanently watertight and weatherproof.
   1. Slope gutters 1/4 inch per foot minimum.

H. Joint Sealers: Install gaskets, joint fillers, and sealants where indicated and where required for weatherproof performance of panel systems. Provide types of gaskets, sealants, and fillers indicated or, if not otherwise indicated, types recommended by panel manufacturer.

1. Install factory-caulked cleats at standing-seam joints.
2. Provide weatherseal under ridge cap. Flash and seal roof panels at eave and rake with closures to exclude weather.

I. Pipe Penetration Flashings: Install in accordance with roofing manufacturer's instructions and recommendations.

3.04 CLEANING

A. Clean exposed sheet metal work at completion of installation. Remove grease and oil films, excess joint sealer, handling marks, and debris from installation, leaving the work clean and unmarked, free from dents, creases, waves, scratch marks, or other damage to the finish.

3.05 PROTECTION

A. Do not permit storage of materials or roof traffic on installed roof panels. Provide temporary walkways or planks as necessary to avoid damage to completed work. Protect roofing until completion of project.

B. Touch-up, repair, or replace damaged roof panels or accessories before date of Substantial Completion.

END OF SECTION

SECTION 07 4213
METAL WALL PANELS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Manufactured metal panels for walls, with related flashings and accessory components.

B. Compatible and matching finishing and trim.

1.02 RELATED REQUIREMENTS

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

B. Section 01 7800 - Closeout Submittals.

C. Section 05 4000 - Cold-Formed Metal Framing: Wall panel substrate.

D. Section 07 2100 - Thermal Insulation: Rigid insulation under wall panels.

E. Section 07 9000 - Joint Sealers.

1.03 DESIGN REQUIREMENTS

A. Components: Design and size components to withstand dead and live loads caused by positive and negative wind pressure acting normal to plane of wall as calculated in accordance with NCSBC, Current Edition code.

B. Maximum Allowable Deflection of Panel: L/175 of span or 3/4", whichever is less.

C. Movement: Accommodate movement within system without damage to components or deterioration of seals, movement within system; movement between system and perimeter components when subject to seasonal temperature cycling; dynamic loading and release of loads; and deflection of structural support framing.

D. Drainage: Provide positive drainage to exterior for moisture entering or condensation occurring within panel system.

1.04 SUBMITTALS

A. See General and Supplementary General Conditions for submittal procedures.

B. Qualification Data: Indicating compliance with Quality Assurance Article.

C. Product Data: Manufacturer’s product literature on each product to be used.

D. Shop Drawings: Include layouts of wall panels, details of edge and penetration conditions, joints, corner, supports, anchorages, spacing and type of connections, flashings and closures, underlayments and special conditions.
   1. Differentiate between shop and field fabrication.

E. Selection Samples: For each wall panel system specified, submit color chips representing manufacturer's full range of available colors and patterns.

F. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

1.05 QUALITY ASSURANCE

A. Field Measurements: Verify actual dimensions by field measurement before fabrication; show recorded measurements on shop drawings.

B. Manufacturer Qualifications: Company specializing in manufacturing products similar to those required for this project, with not less than 5 years of documented experience.

C. Installer Qualifications: Company specializing and experienced in performing work of the type specified in this section.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Provide strippable plastic protection on prefinished wall panels for removal after installation.

B. Store wall panels on project site as recommended by manufacturer to minimize damage to panels prior to installation.

C. Store prefinished material off ground and protected from weather. Prevent twisting, bending, or abrasion, and provide ventilation to stored materials. Slope metal sheets to ensure drainage.

D. Prevent contact with materials that may cause discoloration or staining of products.

1.07 WARRANTY

A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.

B. Panel Warranty: Provide a minimum of five year installation warranty commencing on date of Final Acceptance of the work or Beneficial Occupancy. Correct defective work for panel installation and workmanship and damage caused by exposure to weather and defects in integrity of seals.

C. Panel Finish Warranty: Provide finish warranty stating that finish will perform as follows for a minimum of 20 years, commencing on date of Final Acceptance of the work or Beneficial Occupancy, against Chalking (No more than that represented by a No. 8 rating based on ASTM D4214), Color Retention (No fading or color change in excess of 5 Hunter color difference units calculated in accordance with ASTM D 2244.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Acceptable Manufacturers: Subject to compliance with requirements, acceptable manufacturers include, but are not limited to:
   1. ATAS International, Inc.
   2. Berridge Manufacturing Co.
   3. Consolidated Systems, Inc.
   4. Dimensional Metals, Inc.
   5. McElroy Metal.
   6. Metal Building Components, Inc. (MBCI).
   7. Petersen Aluminum Corporation.
   8. Triad Corrugated Metal, Inc.

2.02 MATERIALS

A. Steel Sheet: Aluminum-zinc alloy-coated steel sheet conforming to ASTM A 792/A 792M; AZ50 coating.
   1. Steel Grade: 50 ksi.
   2. Steel Thickness: Minimum 24 gauge.

B. Flashing: Sheet aluminum: 0.040 inch thick, minimum, finish and color to match wall panels.

C. Anchors, Clips and Accessories: Use one of the following:
   1. Stainless steel complying with ASTM A4 80/A 480M, ASTM A 276 or ASTM A 666.
   2. Steel complying with ASTM A 36/A 36M and hot-dipped galvanized to ASTM A 153/A 153M.
   3. Steel complying with ASTM A 36/A 36M and hot-dipped galvanized to ASTM A 123/A 123M Coating Grade 10.

2.03 WALL PANELS

A. Panel System: Concealed fastener wall panel system for horizontal installation; installed over rigid insulation and sheathing over open framing.
   1. Basis of Design: MBCI Masterline 16.

B. Exterior Wall Panel: Factory-formed wall panels with factory-applied finish. Interlocking design.
   1. Panel Depth: 7/8 inch.
   2. Panel Coverage: 16 inch.
   3. Profile: Corrugated.
   4. Finish: Smooth.

C. Internal and External Corners: Match material, thickness, and finish on wall panels; shop cut and factory mitered to required angles.

D. Expansion Joints: Same material, thickness and finish as exterior sheets; manufacturer's standard brake formed type, of profile to suit system.

E. Trim, Closure Pieces, Flashings: Match material, thickness and finish on wall panels; brake formed to required profiles.

2.04 PANEL FINISH

A. Exterior Finish, Fluoropolymer Coating System: Manufacturer’s standard multi-coat thermo-cured coating system, including primer and minimum 70 percent fluoropolymer color topcoat. Minimum total dry film thickness of 0.9 mil. Reflective gloss 30% when tested per ASTM D523. Provide coating that has been field tested under normal range of weathering conditions for minimum of 20 years without significant peel, blister, flake, chip, crack, or check in finish; without chalking in excess of No. 8 in accordance with ASTM D 659; and without fading in excess of 5 NBS units. Color and gloss to match sample.

B. Interior Finish: Manufacturer’s standard primer coat and wash coat or acrylic or polyester backer finish, 0.3 mil total dry film thickness.

C. Color/Texture: As selected by Architect from manufacturer’s full range.

2.05 ACCESSORIES

A. General: Provide all accessories required for a complete installation, including fasteners, clips, anchorage and attachments.

B. Gaskets: Manufacturer's standard type suitable for use with system, permanently resilient; ultraviolet and ozone resistant.

C. Joint Sealer: Manufacturer’s recommended silicone sealant, ASTM C 920 Type S, Grade NS, Class 100/50.

D. Fasteners: Manufacturer's standard concealed fasteners to suit application and withstand design loads; with soft neoprene washers, steel, hot dip galvanized.

E. Field Touch-up Paint: As recommended by panel manufacturer.

F. Bituminous Paint: Asphalt base.

2.06 FABRICATION

A. Fabricate and finish panels and accessories at the factory to greatest extent possible, by manufacturer's standard procedures and processes, as required to fulfill indicated performance requirements demonstrated by laboratory testing. Field rolling of panels is not permitted. Comply with indicated profiles and dimensional requirements and with structural requirements.
   1. Portable roll formers are not permissible.

B. Form sections true to shape, accurate in size, square, and free from distortion or defects.

C. Form pieces in longest practicable lengths.

D. Fabricate corners in one continuous piece with minimum 2 inch returns.

E. Apply finish coatings either before or after forming and fabricating panels, as required by coating process and as required for maximum coating performance capability. Protect coating with strippable film or by packing suitable material between panels in a manner to properly protect the finish. Furnish air-drying spray finish in matching color for touch-up.

F. Apply bituminous coating or other permanent separation materials on concealed panel surfaces where panels would otherwise be in direct contact with substrate materials that are noncompatible or could result in corrosion or deterioration of either material or finishes.

PART 3 EXECUTION

3.01 EXAMINATION

A. Notify Architect in writing of conditions detrimental to proper and timely completion of work. Do not proceed with erection until unsatisfactory conditions have been corrected.

3.02 PREPARATION

A. Remove protective film from surface of wall panels immediately prior to installation. Strip film carefully, to avoid damage to prefinished surfaces.

B. Separate dissimilar metals by applying a bituminous coating, self-adhering rubberized asphalt sheet, or other permanent method approved by roof panel manufacturer.

C. Where metal will be in contact with wood or other absorbent material subject to wetting, seal joints with sealing compound and apply one coat of heavy-bodied bituminous paint.

3.03 INSTALLATION

A. Install panels on walls in accordance with manufacturer's instructions, as applicable to specific project conditions and substrates. Install all components as required for a complete assembly.

B. Minimize field cutting of panels. Where field cutting is absolutely required, use methods that will not distort panel profiles. Use of torches for field cutting is absolutely prohibited.

C. Protect surfaces in contact with cementitious materials and dissimilar metals with bituminous paint. Allow to dry prior to installation.

D. Fasten panels to structural supports; aligned, level, and plumb.

E. Locate joints over supports. Lap panel ends minimum 2 inches.

F. Allow for thermal and structural movement. Provide expansion joints where required by manufacturer or as indicated on drawings.

G. Use concealed fasteners unless otherwise approved by Architect.

H. Install gaskets, joint fillers, and sealants where indicated and where required for weatherproof performance of panel systems. Provide types of gaskets, sealants, and fillers indicated or, if not otherwise indicated, types recommended by panel manufacturer. Maintain neat appearance.

3.04 TOLERANCES

A. Maximum Offset From True Alignment Between Adjacent Members Butting or In Line: 1/16 inch.

B. Maximum Variation from Plane or Location Indicated on Drawings: 1/4 inch.

3.05 CLEANING AND PROTECTION

A. Remove site cuttings from finish surfaces.

B. Clean and wash prefinished surfaces with mild soap and water; rinse with clean water.

C. Touch-up, repair, or replace damaged wall panels or accessories before date of Substantial Completion.

END OF SECTION

SECTION 07 6200
SHEET METAL FLASHING AND TRIM

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Fabricated sheet metal items, including flashings, counterflashings, and soffit panels.

1.02 RELATED REQUIREMENTS

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

B. Section 04 2000 - Unit Masonry: Metal Flashing Embedded in Unit Masonry.

C. Section 07 2500 - Weather Barriers: Flexible flashings and transition membranes included in weather barrier systems.

D. Section 07 4113 - Metal Roof Panels: Premanufactured metal roof panels, gutters, downspouts, and associated roof edge trim.

1.03 SUBMITTALS

A. See General and Supplementary General Conditions for submittal procedures.

B. Qualification Data: Indicating compliance with Quality Assurance Article.

C. Shop Drawings: Indicate material profile, jointing pattern, jointing details, fastening methods, flashings, terminations, and installation details.

D. Samples for Initial Color Selection: Submit color chips representing manufacturer's full range of available colors and patterns on actual substrate materials.

1.04 QUALITY ASSURANCE

A. Perform work in accordance with SMACNA Architectural Sheet Metal Manual requirements and standard details, except as otherwise indicated.

B. Fabricator and Installer Qualifications: Company specializing in sheet metal work with five years of documented experience.

1.05 PROJECT CONDITIONS

A. Coordinate work of this section with interfacing and adjoining work for proper sequencing of each installation. Ensure best possible weather resistance and durability of work and protection of materials and finishes.

B. Provide miscellaneous flashings as required to divert the flow of rainwater out of and away from building components.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Stack material to prevent twisting, bending, and abrasion, and to provide ventilation. Slope metal sheets to ensure drainage.

B. Prevent contact with materials that could cause discoloration or staining.

PART 2 PRODUCTS

2.01 SHEET MATERIALS

A. Galvanized Steel: ASTM A 653/A 653M, with G90/Z275 zinc coating; minimum .0359 inch thick (20 gage) unless otherwise noted.

B. Pre-Finished Galvanized Steel: ASTM A 653/A 653M, with G90/Z275 zinc coating; minimum .0359 inch thick (20 gage) unless otherwise noted, shop pre-coated with PVDF coating.

1. PVDF (Polyvinylidene Fluoride) Coating: Superior Performance Organic Finish, AAMA 2605; multiple coat, thermally cured fluoropolymer finish system.

2. Color: As selected by Architect from manufacturer's standard colors.

C. Aluminum: ASTM B 209 (ASTM B 209M);0.032 inch thick unless otherwise noted; anodized finish of color as selected.
1. Color Anodized Finish: AAMA 611 AA-M12C22A42/44 Class I integrally or electrolytically colored anodic coating not less than 0.7 mils thick.
2. Color: As selected by Architect from manufacturer's standard colors.

2.02 SOFFIT PANELS

A. Basis of Design: Berridge “Vee-Panel”.

B. Soffit Panels: Manufacturer’s standard factory-formed and finished panel system, configured with interlocking sidelap to conceal fasteners.
1. Steel Panels: Aluminum-zinc alloy-coated SS (structural steel) sheet conforming to ASTM A 792/A 792M; minimum AZ50 coating. Minimum 24 gage steel.
2. Configuration: 12 inch exposure, 3/8 inch deep panels, 3/8 inch vee grooves at 4” on center.
3. Provide solid panels without vents.
4. Color: Colors to be selected by Architect from samples provided.

2.03 ACCESSORIES

A. Fasteners: Utilize fasteners, with soft neoprene washers, fabricated from compatible metal to avoid electrolytic reaction.

B. Primer: Zinc chromate type, for use with aluminum, stainless steel or galvanized steel.

C. Primer: Galvanized iron type, for use with galvanized steel.

D. Protective Backing Paint: Zinc molybdate alkyd.

E. Protective Backing Paint: Asphaltic mastic.

F. Sealant: As specified in Section 07 9000.

G. Plastic Cement: ASTM D 4586, Type I.

H. Solder: ASTM B 32; Sn50 (50/50) type.

2.04 FABRICATION

A. General Metal Fabrication: Shop-fabricate work to greatest extent possible. Factory-fabricated roof edge systems are required. Comply with details shown and with applicable requirements of SMACNA "Architectural Sheet Metal Manual" and other recognized industry practices. Fabricate for waterproof and weather-resistant performance, with expansion provisions for running work, sufficient to permanently prevent leakage, damage, or deterioration of the work. Form work to fit substrates. Comply with material manufacturer instructions and recommendations for forming material. Form exposed sheet metal work without excessive oil-canning, buckling, and tool marks, true to line and levels indicated, with exposed edges folded back to form hems.

B. Seams: Fabricate nonmoving seams in sheet metal with flat-lock seams. For metal other than aluminum, tin edges to be seamed, form seams, and solder. Form aluminum seams with epoxy seam sealer; rivet joints for additional strength where required.

C. Expansion Provisions: At moving joints, use sealed lapped, bayonet-type or interlocking hooked seams. Where lapped or bayonet-type expansion provisions in work cannot be used or would not be sufficiently water/weatherproof, form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with mastic sealant (concealed within joints).

D. Sealant Joints: Where movable, nonexpansion type joints are indicated or required for proper performance of work, form metal to provide for proper installation of elastomeric sealant, in compliance with SMACNA standards.

E. Separations: Provide for separation of metal from noncompatible metal or corrosive substrates by coating concealed surfaces at locations of contact, with bituminous coating or other permanent separation as recommended by manufacturer/fabricator.

F. Form sections true to shape, accurate in size, square, and free from distortion or defects.

G. Form pieces in longest possible lengths.

H. Hem exposed edges on underside 1/2 inch; miter and seam corners.

I. Fabricate corners from one piece with minimum 18 inch long legs; seam for rigidity, seal with sealant.

J. Fabricate vertical faces with bottom edge formed outward 1/4 inch (6 mm) and hemmed to form drip.

PART 3 EXECUTION

3.01 PREPARATION

A. Install starter and edge strips, and cleats before starting installation.

B. Back paint concealed metal surfaces with protective backing paint to a minimum dry film thickness of 15 mil.

3.02 INSTALLATION

A. General: Except as otherwise indicated, comply with manufacturer's installation instructions and recommendations and with SMACNA "Architectural Sheet Metal Manual." Anchor units of work securely in place by methods indicated, providing for thermal expansion of metal units; conceal fasteners where possible, and set units true to line and level as indicated. Install work with laps, joints, and seams that will be permanently watertight and weatherproof.

B. Conform to drawing details.

C. Provide and install prefinished aluminum flashings where prefinished flashing is indicated on the drawings, unless otherwise noted.
   1. Provide and install prefinished steel flashing at steel roofing systems.

D. Secure flashings in place using concealed fasteners. Use exposed fasteners only where permitted.

E. Apply plastic cement compound between metal flashings and felt flashings.

F. Fit flashings tight in place. Make corners square, surfaces true and straight in planes, and lines accurate to profiles.

G. Bed flanges of work in a thick coat of bituminous roofing cement where required for waterproof performance.

H. Seal metal joints watertight.

I. Clean exposed metal surfaces, removing substances that may cause corrosion of metal or deterioration of finishes.

END OF SECTION

SECTION 07 7100
ROOF SPECIALTIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Snow guards.

B. Roof pipe and penetration flashings.

1.02 RELATED REQUIREMENTS

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

B. Section 07 4113 - Metal Roof Panels: Flashings, sheet metal panels, gutters and downspouts related to manufactured roof panels.

C. Section 07 4113 - Metal Roof Panels: Installation of pipe penetration flashings specified in this Section.

D. Section 07 9000 - Joint Sealers.

1.03 SUBMITTALS

A. See General and Supplementary General Conditions for submittal procedures.

B. Qualification Data: Indicating compliance with Quality Assurance Article.

C. Product Data: Provide data on shape of components, materials and finishes, anchor types and locations.

D. Shop Drawings: Indicate configuration and dimension of components, adjacent construction, required clearances and tolerances, and other affected work.

E. Manufacturer's Installation Instructions: Indicate special procedures and perimeter conditions requiring special attention.

1.04 PROJECT CONDITIONS

A. Coordinate work of this section with interfacing and adjoining work for proper sequencing of each installation. Ensure best possible weather resistance and durability of work and protection of materials and finishes.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Stack material to prevent twisting, bending, and abrasion, and to provide ventilation. Slope metal sheets to ensure drainage.

B. Prevent contact with materials that could cause discoloration or staining.

PART 2 PRODUCTS

2.01 SNOW GUARDS

A. General: Factory fabricated, prefinished rail-type snow retention system consisting of continuous piping with triangular brackets installed at full length of roof eaves. Provide where indicated on the drawings. Mill finish.

1. Configuration: Provide one-pipe system.
2. Continuous Piping: Aluminum tubing, 16 gauge, 1 inch diameter, or 1 inch square profile.
3. Brackets: Single component, cast aluminum. Triangular profile with machined openings to securely hold piping.
    a. Bracket shall clamp securely to standing seam without puncturing or damaging seam material.
4. Mounting: Secure one bracket to each standing seam of metal roof. Attachment to roof panel faces is not permitted.

B. Finish: Mill finish.

C. Basis of Design: SMS Snow Clamp, Snow Management Systems.

D. Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated in the Work include, but are not limited to, the following:
   1. Alpine SnowGuards.
   2. Berger Building Products.
   3. Snow Management Systems.

2.02 PIPE AND PENETRATION FLASHINGS

A. General: Base of rounded aluminum, galvanized steel or thermoplastic, compatible with sheet metal roof systems, and capable of accommodating pipes sized between 0.375 inches and 12 inches.
   1. Caps: EPDM.

2.03 ACCESSORIES

A. Sealant: As specified in Section 07 9000.

B. Roof Cement: ASTM D 4586, Type recommended by manufacturer.

PART 3 EXECUTION

3.01 INSTALLATION REQUIREMENTS

A. General: Except as otherwise indicated, install components in accordance with manufacturer's instructions. Conform to SMACNA Architectural Sheet Metal Manual drawing details as noted.

B. Anchor units of work securely in place by methods indicated, providing for thermal expansion of metal units; conceal fasteners where possible, and set units true to line and level as indicated. Install work with laps, joints, and seams that will be permanently watertight and weatherproof.

C. Coordinate installation of sealants and roofing cement with work of this section to ensure water tightness.

3.02 SNOW GUARD INSTALLATION

A. Install snow management system after the completion of finish roofing system. Comply with manufacturers recommendations and instructions.

B. Secure brackets to standing seams at 4 feet above the bottom edge of the roof.

C. Install snow retention piping, ensuring that all fasteners are properly secured. Ends of tubing shall extend to within 12 inches of valleys, hips and roof edges.

3.03 CLEANING AND PROTECTION

A. Clean exposed metal surfaces, removing substances that might cause corrosion of metal or deterioration of finishes.

END OF SECTION

SECTION 07 9000
JOINT SEALERS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Sealants and joint backing.

B. Precompressed foam sealers.

1.02 RELATED REQUIREMENTS

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

B. Section 01 7800 - Closeout Submittals.

C. Section 07 2500 - Weather Barriers: Sealants required in conjunction with air barriers and vapor retarders:

1.03 ADMINISTRATIVE REQUIREMENTS

A. Coordinate the work with other sections referencing this section.

1.04 SUBMITTALS

A. See General and Supplementary General Conditions for submittal procedures.

B. Product Data: Provide data indicating sealant chemical characteristics, performance criteria, substrate preparation, limitations, and color availability.

C. Samples: Submit full set of samples illustrating sealant colors for selection.

D. Manufacturer's Installation Instructions: Indicate special procedures.

1.05 QUALITY ASSURANCE

A. Single Source Responsibility for Joint Sealant Materials: Obtain joint sealant materials from a single manufacturer for each different product required.

B. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum three years documented experience.

1.06 WARRANTY

A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.

B. Correct defective work within a five year period after date of Final Acceptance of the work or Beneficial Occupancy.

C. Warranty: Include coverage for installed sealants and accessories which fail to achieve airtight seal, exhibit loss of adhesion or cohesion, or do not cure.

PART 2 PRODUCTS

2.01 SEALANTS

A. Compatibility: Provide joint sealants, joint fillers, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by sealant manufacturer based on testing and field experience.

B. Colors: Provide color of exposed joint sealants as selected by the Architect from manufacturer's full range of standard colors for products of type indicated.

2.02 SEALANTS FOR EXTERIOR USE

A. Type ES1 - Polyurethane Sealant: ASTM C 920 Type S, Grade NS, Class 25. Uses NT, M, A, O. Single component, moisture curing, non-sag, non-staining, non bleeding, capable of continuous water immersion.
   1. Color: Match adjacent finished surfaces.
   2. Movement Capability: Plus and minus 25 percent.
   3. Service Temperature Range: -20 to 180 degrees F.
   4. Shore A Hardness Range: 20 to 35.
   5. Applications: Use for:
      a. Exterior and interior control, expansion, and soft joints in concrete or masonry.
      b. Other exterior joints for which no other sealant is indicated.
   6. Available Products: Subject to compliance with requirements, elastomeric sealants that may be incorporated in the Work include, but are not limited to:
      a. Dynatrol I-XL, Pecora Corporation.
      b. MasterSeal NP1, Master Builders Solutions, BASF.
      c. Dymonic, Tremco.
      d. Substitutions: See General Conditions.

B. Type ES2 - Polyurethane Sealant: ASTM C 920 Type M, Grade NS, Class 50. Uses T, NT, M, A, O. Multiple component, chemical curing, non-sag, non-staining, non bleeding, capable of continuous water immersion.
   1. Color: Match adjacent finished surfaces.
   2. Movement Capability: Plus and minus 25 percent.
   3. Service Temperature Range: -20 to 180 degrees F.
   4. Shore A Hardness Range: 20 to 35.
   5. Applications: Use for:
      a. Exterior and interior control, expansion, and soft joints in concrete or masonry.
      b. Exterior and interior joints between concrete or masonry and other materials.
      c. Other exterior joints for which no other sealant is indicated.
   6. Available Products: Subject to compliance with requirements, elastomeric sealants that may be incorporated in the Work include, but are not limited to:
      a. Dynatrol II, Pecora Corporation.
      b. SikaFlex 2C NS, Sika
      c. Dymeric, Tremco.
      d. Substitutions: See General Conditions.

C. Type ES3 - Self-Leveling Polyurethane Sealant: ASTM C 920, Type S, Grade P, Class 25, Uses T, I, M, A, O. Single component, chemical curing, non staining, non bleeding, capable of continuous water immersion, self-leveling type.
   1. Color: to be selected by the architect.
   2. Movement Capability: Plus and minus 25 percent.
   3. Service Temperature Range: -40 to 180 degrees F.
   4. Shore A Hardness Range: 20 to 35.
   5. Applications: Use for:
      a. Exterior joints in horizontal surfaces of concrete.
      b. Exterior joints in horizontal surfaces between concrete and metal.
      c. Exterior joints in horizontal surfaces between concrete and masonry.
   6. Available Products: Subject to compliance with requirements, elastomeric sealants that may be incorporated in the Work include, but are not limited to:
      a. Urexpan NR-201, Pecora Corp.
      b. MasterSeal SL1, Master Builders Solutions, BASF.
      c. Vulkem 45, Tremco.
      d. Substitutions: See General Conditions.

D. Type ES5 - Silicone Sealant: ASTM C 920 Type S, Grade NS, Class 50, Uses NT, A, G, M, O; single component, neutral curing, non-sagging, non-staining, non-bleeding.
   1. Movement Capability: Plus and minus 50 percent.
   2. Service Temperature Range: -60 to 180 degrees F.
   3. Shore A Hardness Range: 15 to 35.
   4. Applications: Use for:
      a. Exposed joints within glazed hollow metal framing systems, interior and exterior.
   5. Available Products: Subject to compliance with requirements, elastomeric sealants that may be incorporated in the Work include, but are not limited to:
      a. 999-A, Dow Corning
      b. Contractors 1000, GE
      c. 864NST, Pecora Corp.
      d. Spectrem 3, Tremco.
      e. Substitutions: See General Conditions.

E. Type ES6 - Tape Sealant: Solvent-free, butyl-based tape sealant with a solids content of 100 percent, nonstaining, paintable, and non-migrating in contact with nonporous surfaces, with or without reinforcement thread to prevent stretch and packaged on rolls with a release paper on one side.
   1. Available Products: Subject to compliance with requirements, tape sealants that may be incorporated in the Work include, but are not limited to, the following:
      a. Extru-Seal Tape, Pecora Corp.
      b. Illbruck Window Flashing Tape, Willseal USA.
      c. Tremco 440 Tape, Tremco, Inc.
      d. Tremco ET 675, Tremco.
      e. Substitutions: See General Conditions.

2.03 SEALANTS FOR INTERIOR USE

A. Type IS1 - Silicone Sealant: ASTM C 920, Type S, Grade NS, Class 50, Uses NT, A, G, M, O; single component, neutral curing, non-sagging, non-staining, fungus resistant, non-bleeding.
   1. Movement Capability: Plus and minus 50 percent.
   2. Service Temperature Range: -60 to 180 degrees F.
   3. Shore A Hardness Range: 25 to 35.
   4. Applications: Use for:
      a. Interior joints between plumbing fixtures and adjacent floors, walls.
   5. Available Products: Subject to compliance with requirements, elastomeric sealants that may be incorporated in the Work include, but are not limited to:
      a. Sanitary 1700, GE
      b. 786 Mildew Resistant, Dow Corning
      c. 898NST, Pecora Corp.
      d. Substitutions: See General Conditions.

B. Type IS2 - Acrylic Emulsion Latex Sealant: ASTM C 834, Type OP, Grade NF. Single component, paintable.
   1. Color: Match adjacent finished surfaces.
   2. Applications: Use for:
      a. Interior joints in gypsum drywall, plaster, concrete and masonry.
      b. Interior joints between door and window frames and wall surfaces.
      c. Other interior joints for which no other type of sealant is indicated.
   3. Available Products: Subject to compliance with requirements, elastomeric sealants that may be incorporated in the Work include, but are not limited to:
      a. AC-20, Pecora Corp.
      b. Siliconized Acrylic Construction Grade (35 Year) Sealant, Red Devil.
      c. Tremflex 834, Tremco, Inc.
      d. Substitutions: See General Conditions.

2.04 JOINT SEALANT BACKING

A. General: Provide sealant backings of material and type that are non-staining; are compatible with joint substrates, sealants, primers and other joint fillers; and are approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.

B. Joint Backing: Round foam rod compatible with sealant; ASTM D 1056, sponge or expanded rubber; oversized 30 to 50 percent larger than joint width.

C. Joint Backing: Round foam rod compatible with sealant; ASTM D 1667, closed cell PVC; oversized 30 to 50 percent larger than joint width.

D. Bond Breaker: Pressure sensitive tape recommended by sealant manufacturer to suit application.

2.05 ACCESSORIES

A. Primer: Non-staining type, recommended by sealant manufacturer to suit application.

B. Joint Cleaner: Non-corrosive and non-staining type, recommended by sealant manufacturer; compatible with joint forming materials.

C. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that substrate surfaces and joint openings are ready to receive work.

B. Verify that joint backing and release tapes are compatible with sealant.

3.02 PREPARATION

A. Clean and prime joints in accordance with manufacturer's instructions.

B. Protect elements surrounding the work of this section from damage or disfigurement.

3.03 INSTALLATION

A. Perform work in accordance with sealant manufacturer's requirements for preparation of surfaces and material installation instructions.

B. Perform installation in accordance with ASTM C 1193.

Perform acoustical sealant application work in accordance with ASTM C 919.

C. Measure joint dimensions and size joint backers to achieve width-to-depth ratio, neck dimension, and surface bond area as recommended by manufacturer, except where specific dimensions are indicated.

D. Install bond breaker where joint backing is not used.

E. Install sealant free of air pockets, foreign embedded matter, ridges, and sags.

F. Apply sealant within recommended application temperature ranges. Consult manufacturer when sealant cannot be applied within these temperature ranges.

G. Tool joints concave.

H. Precompressed Foam Sealant: Do not stretch; avoid joints except at corners, ends, and intersections; install with face 1/8 to 1/4 inch below adjoining surface.

3.04 CLEANING

A. Clean adjacent soiled surfaces.

3.05 PROTECTION

A. Protect sealants until cured.

END OF SECTION

SECTION 08 1113
HOLLOW METAL DOORS AND FRAMES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Non-fire-rated steel doors and frames.

1.02 RELATED REQUIREMENTS

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

B. Section 04 2000 - Unit Masonry: Building in anchors and grouting frames set in masonry construction.

C. Section 08 7100 - Door Hardware.

D. Section 08 8000 - Glazing: Glass for doors.

E. Section 09 9000 - Painting and Coating: Field painting.

1.03 SUBMITTALS

A. See General and Supplementary General Conditions for submittal procedures.

B. Qualification Data: Indicating compliance with Quality Assurance Article.

C. Product Data: Materials and details of design and construction, hardware locations, reinforcement type and locations, anchorage and fastening methods, and finishes; and one copy of referenced grade standard.

D. Shop Drawings: Details of each opening, showing elevations, glazing, frame profiles.

E. Installation Instructions: Manufacturer's published instructions, including any special installation instructions relating to this project.

F. Manufacturer's Certificate: Certification that products meet or exceed specified requirements.

1.04 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Store in accordance with NAAMM HMMA 840.

B. Protect with resilient packaging; avoid humidity build-up under coverings; prevent corrosion.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Steel Doors and Frames: Subject to compliance with requirements, manufacturers include but are not limited to:
   1. Assa Abloy: Ceco, Curries, or Fleming.
   2. Windsor Republic Doors.
   3. Steelcraft.
   4. Substitutions: See General Conditions.

2.02 MATERIALS

A. Cold Rolled Steel: Commercial quality carbon steel. Comply with ASTM A1008 and ASTM A568.

B. Hot Rolled Steel: Commercial quality carbon steel, pickled and oiled. Comply with ASTM A1011 and ASTM A568.

C. Galvanizing: Hot-dipped zinc coated steel of commercial quality, complying with ASTM A924 and ASTM A653. Coating shall meet or exceed the minimum requirements for A40 coatings.

D. Shop-Applied Primer: Rust-inhibiting, complying with ANSI A250.10, door manufacturer's standard.

E. Bituminous Coating: Asphalt emulsion or other high-build, water-resistant, resilient coating.

2.03 DOORS AND FRAMES, GENERAL

A. Provide doors and frames in sizes and configurations noted on the drawings.

B. Glazed Lights: Sizes and configurations as indicated on drawings.
   1. Glazing Stops: Minimum 20 gage steel or 0.40 inch thick aluminum.
      a. Provide screw applied removable glazing beads on inside of glass.
      b. Provide non-removable stops on outside of exterior doors.

C. Galvanizing: Provide galvanized doors and frames for all exterior doors.

2.04 STEEL DOORS

A. General: Comply with ANSI 250.8 and as herein specified. Fabricate exposed faces of doors and panels, including stiles and rails of nonflush units, from only cold-rolled steel. Fabricate frames, concealed stiffeners, reinforcement, edge channels, louvers and moldings from either cold-rolled or hot-rolled steel.
   1. Accessibility: Comply with ANSI/ICC A117.1.
   2. Door Top Closures: Flush with top of faces and edges.
   3. Door Edge Profile: Square or beveled on both edges per manufacturer’s standard.
   4. Door Texture: Smooth faces.
   5. Thickness: 1-3/4 inches.
   6. Core Construction: Manufacturer’s standard honeycomb, polyurethane, polystyrene, steel channel grid, vertical steel stiffeners, or rigid mineral fiber core with internal sound deadener on inside of face sheets where appropriate.

B. Exterior Doors:
   1. Grade: ANSI A250.8 Level 3, physical performance Level A, Model 2, seamless.
   2. Thermal-Rated (Insulating) Assemblies: At all exterior locations provide doors fabricated as thermal insulating door and frame assemblies and tested in accordance with ASTM C 236 or ASTM C 976 on fully operable door assemblies.
      a. U-value of 0.48 maximum, when tested in accordance with ASTM C 1363.

C. Interior Doors, Non-Fire-Rated:
   1. Grade: ANSI A250.8 Level 2, physical performance Level B, Model 2, seamless.

2.05 STEEL FRAMES

A. General: Provide metal frames for doors, transoms, sidelights, borrowed lights, and other openings, of types and styles as shown on drawings and schedules. Conceal fastenings, unless otherwise indicated. Fabricate frames of minimum 18-gage cold-rolled steel.
   1. Frames for Steel Doors: Comply with frame requirements specified in ANSI 250.8 as follows:
      a. Exterior Doors: Level 3, 16 gage frames.
      b. Interior Doors: Level 2, 16 gauge frames.
   2. Provide mortar guard boxes for hardware cut-outs in frames to be installed in masonry or to be grouted.
   3. Frames in Masonry Walls: Size to suit masonry coursing with head member 4 inches high to fill opening without cutting masonry units.

B. Exterior Door Frames: Full profile welded.
   1. Weatherstripping: Separate, see Section 08 7100.

C. Interior Door Frames: Full profile welded type.

D. Door Silencers: Except on weatherstripped frames, drill stops to receive three silencers on strike jambs of single door frames.

2.06 FABRICATION

A. Fabricate steel door and frame units to be rigid, neat in appearance and free from defects, warp or buckle. Wherever practicable, fit and assemble units in manufacturer's plant. Clearly identify work that cannot be permanently factory-assembled before shipment, to assure proper assembly at project site.

B. Hardware Preparation: In accordance with BHMA A156.115, “American National Standard for Hardware Preparation in Steel Doors and Steel Frames”, with reinforcement welded in place, in addition to other requirements specified in door grade standard. Comply with ANSI A250.6, “Recommended Practice for Hardware Reinforcing on Standard Steel Doors and Frames” where applicable.
   1. Prepare doors and frames to receive mortised and concealed hardware in accordance with final Door Hardware Schedule and templates provided by hardware supplier. Comply with applicable requirements of ANSI A115 Series Specifications for door and frame preparation for hardware.
   2. Reinforce doors and frames to receive surface-applied hardware. Drilling and tapping for surface-applied hardware may be done at project site.

C. Factory Priming: Clean, treat, and paint exposed surfaces of steel door and frame units, including galvanized surfaces. Apply rust-inhibitive enamel or paint after fabrication, either air-drying or baking, suitable as a base for specified finish paints complying with ANSI A250.10, "Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames."

2.07 ACCESSORY MATERIALS

A. Supports and Anchors: Fabricate of not less than 18-gage sheet steel; galvanized where used with galvanized frames. Provide minimum three anchors per jamb, suitable for adjoining wall construction.
   1. Base Anchors: Provide frames with base anchors for attachment to floor. For wall conditions that do not allow for use of base anchor, provide additional jamb anchor.

B. Inserts, Bolts and Fasteners: Manufacturer's standard units. Where items are to be built into exterior walls, hot-dip galvanize in compliance with ASTM A153, Class C or D as applicable.

C. Exposed Fasteners: Unless otherwise indicated, provide countersunk flat or oval heads for exposed screws and bolts.

D. Glazing: As specified in Section 08 8000, factory installed.

E. Removable Stops: Provide one of the following:
   1. Formed sheet steel, shape as indicated on drawings, mitered or butted corners; prepared for countersink style tamper proof screws.
   2. Rolled steel bar, shape as indicated on drawings, mitered or butted corners; prepared for countersink style tamper proof screws.

F. Grout for Frames: Portland cement grout of maximum 4-inch slump for hand troweling; thinner pumpable grout is prohibited.

G. Temporary Frame Spreaders: Provide for all factory- or shop-assembled frames.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions before starting work.

B. Verify that opening sizes and tolerances are acceptable.

3.02 PREPARATION

A. Coat inside of frames to be installed in masonry or to be grouted, with bituminous coating, prior to installation.

3.03 INSTALLATION

A. Install frames plumb, level, rigid and true in accordance with the requirements of the specified door grade standard, ANSI A250.11 “Recommended Erection Instructions for Steel Frames,” and NAAMM HMMA 840 “Guide Specification for Installation and Storage of Hollow Metal Doors and Frames.”

B. Coordinate frame anchor placement with wall construction.

C. In masonry walls, install frames prior to laying masonry; anchor frames into masonry mortar joints. Grout frames in masonry construction, fill jambs with grout as walls are laid up using hand trowel methods; brace frames so that pressure of grout before setting will not deform frames.

D. Coordinate installation of hardware.

E. Coordinate installation of glazing.

3.04 CLEARANCES AND TOLERANCES

A. Clearances Between Door and Frame: As specified in ANSI A250.8.

B. Maximum Diagonal Distortion: 1/16 inch measured with straight edge, corner to corner.

C. Tolerances: Comply with SDI-117, “Manufacturing Tolerances for Standard Steel Doors and Frames.”

3.05 ADJUSTING AND CLEANING

A. Prime Coat Touch-Up: Immediately after erection, sand smooth any rusted or damaged areas of prime coat and apply touch-up of compatible air-drying primer.

B. Adjust for smooth and balanced door movement.

END OF SECTION

SECTION 08 3613
SECTIONAL DOORS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Overhead sectional doors, operating hardware and supports.

B. Electrical motor operation and controls.

C. Wiring from electric circuit disconnect to operator to control station.

1.02 RELATED REQUIREMENTS

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

B. Section 01 7800 - Closeout Submittals.

C. Section 07 9000 - Joint Sealers: Perimeter sealant and backup materials.

D. Section 09 9000 - Painting and Coating: Finish painting.

E. Division 26 Sections: Electrical service to disconnect located near door operator, empty conduit from control units to door operator

1.03 SUBMITTALS

A. See General and Supplementary General Conditions for submittal procedures.

B. Product Data: Submit manufacturer's standard literature showing materials and details of construction and finish, anchorage method and hardware. Include data on electrical operation.

C. Specimen Warranty.

D. Shop Drawings: Indicate rough and actual opening dimensions and required tolerances, anchorage methods, jamb, head and sill conditions, connection details, anchorage spacing, hardware locations, and installation details.
   1. Motorized units: Indicate motor and power source locations.

E. Samples: Submit chips illustrating manufacturer’s full range of available colors and finishes.

F. Manufacturer's Installation Instructions: Include any special procedures required by project conditions.

G. Operation and Maintenance Data: Indicate modes of operation, lubrication requirements and frequency, troubleshooting and periodic adjustments required.
   1. Include data for motor and transmission, shaft and gearing, lubrication frequency, spare part sources.

H. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

1.04 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years of documented experience.

B. Conform to applicable code for motor and motor control requirements.

C. Products Requiring Electrical Connection: Listed and classified by Underwriters Laboratories Inc., as suitable for the purpose specified.

1.05 WARRANTY

A. See Section 01 7800 - Closeout Submittals for warranty requirements.

B. Manufacturer’s Warranty: Submit written warranty, executed by the door manufacturer, agreeing to replace doors that fail in materials or workmanship within the specified warranty

period. Warranty period commences on date of Final Acceptance of the work or Beneficial Occupancy.
1. Warranty Period: One year.
2. Include coverage for electric motor and transmission.

C. Finish Warranty: Submit written warranty, executed by the door manufacturer, agreeing to replace doors that exhibit finish failures, including cracking, splitting, rust deterioration and delamination within the specified warranty period. Warranty period commences on date of Final Acceptance of the work or Beneficial Occupancy.
1. Warranty Period: Ten years.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Products: Subject to compliance with requirements, products include, but are not limited to:
1. Clopay Corporation, Model 3722.
2. Raynor Garage Door Co., Thermaseal 175-20
3. Wayne-Dalton Corporation, Thermosoan 200-20.
4. Substitutions: See General Conditions.

2.02 PERFORMANCE REQUIREMENTS

A. Wind Loading: Provide doors engineered, fabricated, and installed to withstand positive and negative wind loads without undue deflection or damage to components, in conformance with ASTM E 330.
1. Design Wind Load: 20 psf.
2. Safety Factor: 1.5 times design wind load.
3. Maximum Deflection: 1/120 of door width.

B. Thermal Resistance: R-value 16.4, calculated in accordance with DASMA TDS-163.

C. Operational Life: Design door assembly, including operator and counterbalance mechanism, to operate for not less than 25,000 cycles.

2.03 INSULATED STEEL SECTIONAL OVERHEAD DOORS

A. Skin: Roll-formed hot-dipped galvanized steel sheets complying with ASTM A 653, minimum G60 zinc coating complying with ASTM A 525, pressure bonded
1. Thickness, Exterior Skin: 20 gauge, minimum.
2. Thickness, Interior Skin: 28 gauge, minimum.
3. Texture: Smooth, ribbed or stucco, to suit manufacturer's standards.

B. Panels: Exterior and interior skin pressure bonded to foam insulation core with full thermal break, internal hinge reinforcement of 20 gauge galvanized steel, additional internal reinforcement as required to meet performance requirements. Reinforce bottom panel with a continuous channel or angle conforming to bottom section profile.
1. Thickness: nominal 2 inches.

C. End Stiles: Hot dipped galvanized steel, full-height with end caps, minimum 16 gauge.

D. Insulation: CFC and HCFC-free polyurethane core, fully encapsulated.

Windows: None.

E. Windows: Extruded polypropylene windows measuring 8 inches by 24 inches, 1 inch insulated tempered glass.

F. Pass-Doors: None.

G. Finish: Apply manufacturer's standard prime and finish coats, applied to interior and exterior door faces.
1. Color: White.

2.04 TRACKS, SUPPORTS, AND ACCESSORIES

A. General: Provide complete track assembly including brackets, bracing and reinforcing.

B. Tracks: Manufacturer's standard steel track system, hot-dipped galvanized per ASTM A 653, sized for door size and weight, and designed for clearances shown. Fully adjustable for sealing of door to jamb or weatherseal.
   1. Track Width: 2 inches.
   2. Configuration: Standard lift tracks with radius track as indicated.

C. Track Reinforcement and Supports: Galvanized steel members. Secure, reinforce and support tracks as required for size and weight of door to provide strength and rigidity without sag, sway, and vibration during opening and closing of doors.

D. Mounting: Continuous angle mounting. Support and attach tracks to opening jambs with continuous angle welded to tracks and attached to wall. Support horizontal (ceiling tracks) with continuous angle welded to track and supported by laterally braced attachments to overhead structural members at curve and end of tracks.

E. Weather Seals: Continuous rubber, neoprene, or flexible vinyl adjustable weatherstrip gasket at tops and compressible astragal on bottoms of each door.
   1. Jamb Seals: Continuous flexible seals at door jamb edges for a fully weathertight installation.

2.05 HARDWARE

A. General: Provide heavy-duty, rust-resistant hardware, with galvanized or cadmium-plated or stainless steel fasteners, to suit type of door.

B. Hinges: Heavy-duty galvanized steel. Provide double-end hinges, where required, for doors exceeding 16 feet in width, unless otherwise recommended by door manufacturer.

C. Rollers: Provide heavy-duty rollers, sized to suit track, with hardened steel ball bearings in case-hardened steel races, mounted with varying projections to suit slope of track.

D. Locking: Interior mounted slide lock.

2.06 COUNTERBALANCING MECHANISM

A. Spring Counterbalance: Helically wound, tempered steel, adjustable tension torsion spring mounted on steel shaft. Sized to weight of door. Connect to door with high-strength galvanized steel aircraft-type lift cables with a minimum safety factor of 5 to 1.
   1. Spring Cycle Requirements: As indicated at Performance Requirements.

2.07 ELECTRICAL OPERATION

A. Electrical Operator: UL listed, provided by door manufacturer for door with specified operational life, complete with electric motor and factory pre-wired motor controls, starter, gear-reduction unit, clutch, remote control stations, control devices, integral gearing for locking door. Provide all accessories required for proper operation.
   1. Motor: Reversible, continuous-duty, Class A insulated electric motor, complying with NEMA MG1, with overload protection.
      a. Medium duty, trolley type.
      b. Transit speed: 9 to 12 inches per second, in either direction, without exceeding nameplate ratings.
      c. 1/2 HP.
      d. Power characteristics: 120V, single phase.
      e. Service Factor: NEMA MG1.

B. Disconnect Device: Hand-operated disconnect for emergency manual operation, with interlock device to prevent motor from operating when emergency operator is engaged. Mounted in control panel. Provide auxiliary chain hoist for emergency manual operation.

C. Limit Switches: Adjustable switches, interlocked with motor controls, set to automatically stop door at full opened and fully closed positions.

D. Safety Devices: Meet UL 325 requirements for continuous monitoring of safety devices.
   1. Safety Edge: Electro-mechanical or pneumatic sensitized type, wired to reverse door upon striking object.
   2. Photoelectric sensors: NEMA Type 1 device, wired to reverse door if light beam is broken or blocked.

E. Operator Controls:
   1. Control Station: Standard three-button type control with open, close and stop functions for each electrical operator.
      a. Push-button operation.
      b. Recessed.
      c. Locate at inside door jamb.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that wall openings and overhead areas are ready to receive work, and opening dimensions and tolerances are within specified limits.

B. Verify that electric power is available and of the correct characteristics.

3.02 PREPARATION

A. Clean surfaces thoroughly prior to installation.

3.03 INSTALLATION

A. Install door unit assembly in accordance with approved shop drawings and manufacturer's instructions.

B. Coordinate installation with adjacent work to ensure proper clearances and allow for maintenance.

C. Anchor assembly to wall construction without distortion or stress.

D. Securely brace door tracks suspended from structure. Secure tracks to structural members only.

E. Fit and align door assembly including hardware.

F. Coordinate installation of electrical service. Complete power and control wiring from disconnect to unit components.

G. Coordinate installation of sealants and backing materials at frame perimeter as specified in Section 07 9000.

3.04 ADJUSTING

A. Adjust door assembly for smooth operation, without binding or distortion, and full contact with weatherstripping.

B. Have manufacturer's field representative present to confirm proper operation and identify adjustments to door assembly for specified operation.

C. Instruct owner’s personnel in proper operating procedures and maintenance schedule.

3.05 CLEANING AND PROTECTION

A. Clean doors and frames and glazing using methods recommended by manufacturer..

B. Remove temporary labels and visible markings.

C. Protect installed products from damage during subsequent construction.

D. Touch-up, repair or replace damaged products prior to Final Completion.

END OF SECTION

SECTION 08 4500
TRANSLUCENT WALL ASSEMBLIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Insulated translucent sandwich panels.

B. Structural framing members.

1.02 RELATED REQUIREMENTS

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

B. Section 01 2300 - Alternates.

C. Section 01 7800 - Closeout Submittals.

D. Section 07 9000 - Joint Sealers: System perimeter sealant and back-up materials.

1.03 SUBMITTALS

A. See General and Supplementary General Conditions for submittal procedures.

B. Qualification Data: Indicating compliance with Quality Assurance Article.

C. Product Data: Provide component dimensions, describe components within assembly, anchorage and fasteners, panel configuration, and internal drainage details.

D. Manufacturer's Certificate: Certify that products furnished meet or exceed specified requirements.

E. Test Reports: Submit product test reports from a qualified independent testing agency indicating each type and class of panel system complies with the project performance requirements, based on comprehensive testing of current products.

F. Specimen Warranty.

G. Shop Drawings: Provide scaled elevations and all relevant details. Indicate system dimensions, framed opening requirements and tolerances, anticipated deflection under load, attachment to other Work, weep drainage network, expansion and contraction joint location and details, and field welding required.

1. Design Data: Provide framing member structural and physical characteristics, calculations, dimensional limitations.
2. Include structural analysis data signed and sealed by the qualified North Carolina professional engineer who was responsible for its preparation.

H. Samples for Initial Color Selection: Submit color chips representing manufacturer's full range of available colors on actual substrate materials.

I. Installation Data: Special installation requirements.

J. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

1.04 QUALITY ASSURANCE

A. Perform work in accordance with AAMA CW-DG-1.

B. Designer Qualifications: Design structural support framing components under direct supervision of a Professional Structural Engineer experienced in design of this Work and licensed in the State in which the Project is located.

C. Panel Quality Control: Panel system must be listed by the International Code Council – Evaluation Service (ICC-ES) which requires quality control inspections and fire, structural and water infiltration testing of sandwich panel systems by an approved agency.

D. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than ten years of documented experience. Provide evidence of those materials being satisfactorily used on at least six (6) projects of similar size, scope and location. At least three (3) of the projects shall have been in successful use for ten (10) years or longer.

E. Installer Qualifications: Company specializing in performing the work of this section with minimum five years of experience installing the specified panel systems. Provide evidence of satisfactory completion of projects of similar size, scope and type.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Deliver panel system and components in manufacturer' standard protective packaging.

B. Comply with manufacturer's storage and handling instructions.

C. Handle aluminum components in accordance with AAMA CW-10.

D. Protect prefinished aluminum surfaces with wrapping. Do not use adhesive papers or sprayed coatings which bond when exposed to sunlight or weather. Puncture wrappings at ends for ventilation.

1.06 FIELD CONDITIONS

A. Do not install sealants when ambient temperature is less than 40 degrees F.

B. Maintain this minimum temperature during and after installation of sealants.

1.07 WARRANTY

A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.

B. Submit a written warranty executed by manufacturer and installer agreeing to repair or replace panel system work that fails in materials or workmanship within the specified warranty period. Defects will be corrected at no cost to the Owner. Warranty period commences on date of Final Acceptance of the work or Beneficial Occupancy.
   1. Warranty Period: One year.

C. Include coverage for the following: Leakage, excessive deflection, deterioration of finish on metal in excess of normal weathering and defects in accessories, insulated translucent sandwich panels and other components of the work.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Acceptable Sandwich Panel Manufacturers: Subject to compliance with requirements, acceptable manufacturers include, but are not limited to:
   1. Glasscorp.
   2. Kalwall.
   3. Major Industries, Inc.
   4. Substitutions: See General Conditions.

2.02 PERFORMANCE REQUIREMENTS

A. Structural Design: Design and size components to withstand dead loads and live loads caused by snow, hail, and positive and negative wind loads acting on plane of panel without damage or permanent set.
   1. Design Loads: Calculate in accordance with applicable code.
   2. Design Wind Load: 22 lb/sq ft positive and negative.
   3. Measure performance in accordance with ASTM E 330, using test load of 1.5 times the design wind pressure and 10 second duration of maximum load.

B. Seismic Loads: Design and size components to withstand seismic loads and sway displacement as calculated in accordance with applicable code.
   1. Seismic Design Criteria: The IBC Seismic Design Category for the site is C.

C. Air Infiltration: Maximum 0.01 cu ft/min/sq ft per ASTM E 283 at a reference differential pressure of 6.24 psf.

D. Vapor Seal: No vapor seal failure at interior static pressure of 1 inch, 72 degrees F, and 40 percent relative humidity.

E. Water Leakage: None, when measured in accordance with ASTM E 331 at a test pressure difference of 15 lbf/sq ft.

F. Not Permitted: Vibration harmonics, wind whistles, noises caused by thermal movement, thermal movement transmitted to other building elements, loosening, weakening, or fracturing of attachments or components of system.

2.03 MATERIALS

A. Extruded Aluminum: ASTM B 221 (ASTM B 221M).

B. Sheet Aluminum: ASTM B 209 (ASTM B 209M).

C. Sheet Steel: Hot-dipped galvanized steel sheet, ASTM A 653/A 653M, with G60/Z180 coating.

D. Steel Sections: ASTM A 36/A 36M.

E. Fasteners: Stainless steel.

2.04 PANEL COMPONENTS

A. Translucent Face Sheets: Manufactured from glass fiber reinforced thermoset resins, architectural grade. Thermoplastic (polycarbonate, acrylic) faces are not acceptable.
   1. Interior Face Sheets: UL listed, Class B, with flame spread index 50 or less, smoke developed index 250 or less, when tested in accordance with UL 723.
      a. Thickness: .045 inches.
      b. Color: White.
      c. Texture: Smooth.
   2. Exterior face sheets: Weather resistant, color stable throughout entire thickness, maximum color change 3 CIE units Delta E per ASTM D2244. Permanent glass erosion barrier embedded beneath the surface to protect reinforcing fiber; surface loss shall not exceed .7 mills and 40 mgs when tested in accordance with ASTM D-4060 employing CS17 abrasive wheels at a head load of 500 grams for 1000 cycles.
      a. Thickness: .070 inches.
      b. Color: White.
      c. Texture: Smooth.

B. Internal Muntins: Thermally broken extruded aluminum, 6063-T6 or 6005-T5 alloy, with provisions for mechanical interlocking of muntins and perimeter framing.
   1. Muntin Size: Minimum 7/16 inch wide.
   2. Muntin Grid Pattern: 12 inch by 12 inch.

C. Laminate Adhesive: Resin type adhesive, complying with the requirements of ICC “Acceptance Criteria for Sandwich Panel Adhesives.”
   1. Tensile Strength: 750 psi per ASTM C 297 after 12 cycles of aging conditions prescribed by ASTM D 1037.
   2. Shear Strength: Strength as measured by ASTM D 1002:
      a. 540 psi at 50% relative humidity.
      b. 800 psi following accelerated aging per ASTM D 1037, room temperature.
      c. 250 psi following accelerated aging per ASTM D 1037, 180° F.

2.05 INSULATED SANDWICH PANEL SYSTEM

A. Translucent Wall System: Structurally reinforced translucent sandwich panels, with self supporting framing, shop fabricated, factory prefinished, with battens, cap strips, related flashings, anchorage and attachment devices.
   1. System Assembly: Accommodate the following without damage to system, components or deterioration of seals: movement within system; movement between system and perimeter framing components; dynamic loading and release of loads; deflection of structural support framing, tolerance of supporting components.
   2. Expansion / Contraction: Provide for expansion and contraction within system components caused by a cycling temperature range of 170 degrees F over a 12 hour period without causing detrimental effect to system components.
   3. System Internal Drainage: Drain water entering joints, condensation occurring in framing system, or migrating moisture occurring within system, to the exterior by a weep drainage network.
   4. Air and Vapor Seal: Maintain continuous air barrier and vapor retarder throughout assembly, primarily in line with inside face of glazing panel and heel bead of glazing compound. Position thermal insulation on exterior surface of air barrier and vapor retarder.

B. Sandwich Panels: Thermally broken insulated panels with translucent face sheets bonded to both sides of mechanically interlocking extruded aluminum muntins.
   1. Panel Dimensions: as shown on the Drawings.
   2. Panel Thickness: 2-3/4 inches.
   3. Light Transmission: 15 per ASTM E 972.
   4. Solar Heat Gain Coefficient: 0.25.
   5. Panel U Factor: 0.29.
   6. Maximum Deflection: 1.9 inches at 30 psf in a 10 foot span without supporting frame, per ASTM E 72.
   7. Condensation Resistance Factor: CRF of 80 when measured in accordance with AAMA 1503.

C. Structural Battens: Thermally broken extruded aluminum “I” shapes, 6063-T6 or 6005-T5 alloy, nominal 2 inch wide.

D. Perimeter Closures: Thermally broken extruded aluminum channels, 6063-T6 or 6005-T5 alloy.

2.06 SEALANT MATERIALS

A. Sealant and Backing Materials: As specified in Section 07 9000.

2.07 FABRICATION

A. Fabricate system components with minimum clearances and shim spacing around perimeter of assembly, yet enabling installation and dynamic movement of perimeter seal.

B. Prepare components to receive anchor devices. Fabricate anchors.

C. Arrange fasteners and attachments to ensure concealment from view.

D. Reinforce framing members for external imposed loads.

2.08 ALUMINUM FINISHES

A. Finish: Comply with NAAMM’s “Metal Finishes Manual for Architectural and Metal Products.”

B. Mill finish.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify dimensions, tolerances, and method of attachment with other work.

B. Verify wall openings and adjoining air barrier and vapor retarder materials are ready to receive work of this section.

3.02 INSTALLATION

A. Install translucent panel system in accordance with manufacturer instructions.

B. Metal Protection:
   1. Where aluminum will contact dissimilar metals, protect against galvanic action by painting contact surfaces with primer or by applying sealant or tape recommended by manufacturer for this purpose.
   2. Where aluminum will contact concrete or masonry, protect against corrosion by painting contact surfaces with bituminous paint or method recommended by manufacturer.
   3. Where aluminum will contact pressure-treated wood, separate dissimilar materials by methods recommended by manufacturer.

C. Attach to structure to permit sufficient adjustment to accommodate construction tolerances and other irregularities.

D. Provide alignment attachments and shims to permanently fasten system to building structure.

E. Align assembly plumb and level, free of warp or twist. Maintain assembly dimensional tolerances and align with adjacent work.

F. Provide thermal isolation where components penetrate or disrupt building insulation.

G. Accurately fit and secure joints and corners. Make joints flush, hairline, and weatherproof.

H. Install sill flashings.

I. Coordinate attachment and seal of perimeter air and vapor barrier materials.

J. Pack fibrous insulation in shim spaces at perimeter of assembly to maintain continuity of thermal barrier.

K. Install perimeter sealant, backing materials, and installation criteria in accordance with Section 07 9000.

3.03 CLEANING

A. Remove protective material from prefinished aluminum surfaces.

B. Clean the panel system inside and outside, immediately after installation, according to manufacturer's written recommendations.

C. Remove excess sealant by moderate use of mineral spirits or other solvent acceptable to sealant manufacturer.

3.04 PROTECTION

A. Protect finished work from damage.

END OF SECTION

SECTION 08 7100
DOOR HARDWARE

PART 1 GENERAL

1.01 SECTION INCLUDES

A. This Section includes items known commercially as finish or door hardware. Hardware includes but is not limited to:
   1. Butts and Hinges.
   2. Cylinder Locks, Locksets and Keys.
   3. Exit Devices.
   4. Bolts.
   5. Closers.
   6. Hold Opens.
   7. Door Control Devices.
   8. Push, Pull and Protection Plates.
   9. Weatherstripping, Thresholds, Seals, Door Gaskets and Sweeps.
   10. Key Control Systems.

1.02 RELATED REQUIREMENTS

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

B. Section 01 7800 - Closeout Submittals.

C. Section 07 9000 - Joint Sealers.

D. Section 08 1113 - Hollow Metal Doors and Frames.

1.03 ADMINISTRATIVE REQUIREMENTS

A. Coordinate the manufacture, fabrication, and installation of products onto which door hardware will be installed.

B. Furnish templates for door and frame preparation to manufacturers and fabricators of products requiring internal reinforcement for door hardware. Check shop drawings of other work to confirm that adequate provisions are made for locating and installing door hardware.

C. The Hardware Supplier shall meet with the Owner to finalize keying requirements and to obtain final instructions in writing.

D. Hardware Supplier shall provide and install temporary hardware for security and convenience of the Owner if shipment of the permanent hardware would cause delays in construction or use of the building by the Owner.

1.04 SUBMITTALS

A. See General and Supplementary General Conditions for submittal procedures.

B. Qualification Data: Indicating compliance with Quality Assurance Article.
   1. Installers Qualifications: Submit in writing for approval by the Architect and the Hardware Supplier.

C. Product Data: Manufacturer's catalog literature for each item of hardware, marked to clearly show products to be furnished for this project. Include installation instructions, instructions on maintenance of operating parts and finish, and all information necessary to show compliance with requirements. Every proposed substitution shall be accompanied by product data for the originally specified item.

D. Specimen Warranties.

E. Hardware Schedule: Hardware is critical in the project construction schedule. Submit final schedule at earliest possible date. Detailed listing of each item of hardware to be installed on

each door. Organize schedule into hardware sets indicating complete designation of each item for each door or opening. Include the following:

1. Type, style, function and finish of each item.
2. Name and manufacturer of each item.
3. Location of hardware set cross referenced to door numbering scheme as included in the Contract Documents.
4. Fastenings and mounting locations.
5. Keying information.
6. Explanation of all abbreviations, symbols and codes contained in the schedule.

F. Keying Schedule: Manufacturer to submit separate detailed schedule for approval of Owner. Indicate clearly how Owner's final instructions on keying of the locks has been fulfilled.

G. Maintenance Data: Include data on operating hardware, lubrication requirements, and inspection procedures related to preventative maintenance.
   1. Submit manufacturer's parts lists and templates.

H. Maintenance Materials and Tools: Furnish the following for Owner's use in maintenance of project.
   1. Tools: One set of all special wrenches or tools for Owner's continued adjustment, maintenance, and removal and replacement of door hardware. Provide all tools applicable to each different or special hardware component, whether supplied by the hardware component manufacturer or not.

I. Supplier's Certification: Written certification of proper installation.

J. Warranties: Submit manufacturer warranties and ensure forms have been completed in Owner's name and registered with manufacturer.

1.05 QUALITY ASSURANCE

A. Single Source Responsibility: Obtain each type of hardware from a single manufacturer.

B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum ten years of documented experience.

C. Hardware Supplier Qualifications: Company specializing in supplying commercial door hardware, and with a record of successful in-house performance for supplying door hardware similar in quantity, type and quality to that indicated for this Project.

D. Installer Qualifications: Company with no less than 10 years experience in the installation of hardware of similar types and quantities.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Packaging of door hardware is the responsibility of the Hardware Supplier. Sort and repackage in containers marked with the hardware set number.

B. Package hardware items individually; label and identify each package with door opening code to match hardware schedule. Tag each item or package separately with identification corresponding to numbers shown on the drawings and schedules and the final hardware schedule. Include basic installation instructions with each item or package.

1.07 WARRANTY

A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.

B. Provide manufacturer’s standard warranty against defects in materials and workmanship.
   1. Warranty Period, from date of Final Acceptance of the work or Beneficial Occupancy:
      a. Door Closers: Five years.
      b. Exit Devices: Three years.
      c. Locksets: Three years.

PART 2 PRODUCTS

2.01 SCHEDULED HARDWARE

A. Requirements for design, grade, function, finish, size and other distinctive qualities of each type of finish hardware are indicated in the Hardware Schedule at the end of this section. The product designation and name of one manufacturer are listed for each hardware type required for the purpose of establishing hardware to match existing or minimum requirements. Provide either the product designated, or the comparable product of one of the other specified or pre-approved manufacturers that complies with requirements. The burden of proof of equality of proposed substitutions is on the proposer subject to the approval of the Architect concerning deviations or adherence to the design concept.

2.02 DOOR HARDWARE - GENERAL

A. Provide all hardware specified or required to make doors fully functional, compliant with applicable codes, and secure to the extent indicated.

B. Provide all items of a single type of the same model by the same manufacturer.

C. Provide products that comply with the following:
   1. Applicable provisions of federal, state, and local codes.
   2. ANSI/ICC A117.1, American National Standard for Accessible and Usable Buildings and Facilities.
   3. Applicable provisions of NFPA 101, Life Safety Code.

D. Finishes: All door hardware the same finish unless otherwise indicated.
   1. Match items to the manufacturer's standard color and texture finish for the latch and locksets (or push and pull units if no latch or locksets).
   2. For iron and steel base metal required for exterior work, provide 0.2 mil thick copper coating on base metal before applying brass, bronze, nickel or chromium plated finishes.
   3. Finish Definitions: BHMA A156.18. Designations used in schedules and elsewhere to indicate hardware finishes are the industry-recognized standard commercial finishes, except as otherwise noted.
   4. Exceptions:
      a. Where base metal is specified to be different, provide finish that is an appearance equivalent according to BHMA A156.18.
      b. Door Closer Covers and Arms: Color to be selected by Architect from manufacturer's standard colors.
      c. Aluminum Surface Trim and Gasket Housings: Anodized to match door, not to match other hardware.

E. Fasteners:
   1. Furnish screws for installation with each hardware item. Provide Philips flat-head screws unless otherwise indicated.
   2. Provide hardware manufactured to conform to published templates. Do not provide hardware that has been prepared for self-tapping sheet metal screws, except as specifically indicated.
   3. Provide concealed fasteners for hardware units that are exposed when door is closed except to the extent no standard units of type specified are available with concealed fasteners.
   4. Finish screws exposed under any condition to match hardware finish. If exposed in surfaces of other work, match finish of this other work as closely as possible, including prepared-for-paint surfaces to receive painted finish
   5. Concrete and Masonry Substrates: Stainless steel machine screws and lead expansion shields.

2.03 HINGES, BUTTS AND PIVOTS

A. Templates: Except for hinges and pivots to be installed entirely (both leaves) into wood doors and frames, provide only template-produced units.

B. Hinges: Provide hinges on every swinging door.
   1. Provide five-knuckle full mortise butt hinges unless otherwise indicated.
   2. Provide ball-bearing hinges at all doors.
   3. Provide hinges in the quantities indicated.

C. Hinge Pins: Except as otherwise indicated, provide hinge pins as follows:
   1. Outswinging Exterior Doors with Locks: Non-removable pins.
   2. Interior Doors: Non-rising pins**.** Provide non-removable pins for all exterior doors.
   3. Tips: Flat button and matching plug, finished to match leaves.

D. Metals: Provide brass/bronze butts for all USP finish butts.

E. Screws: Provide Philips flat-head screws complying with the following:
   1. For metal doors and frames install machine screws into drilled and tapered holes.
   2. Finish screw heads to match surface of hinge or pivot.

F. Size: 4-1/2 inch by 4-1/2 inch typical unless otherwise noted. Provide 5 inch by 4-1/2 inch hinge for doors over 36 inches in width.

G. Quantity of Hinges Per Door:
   1. Doors up to 60 inches High: Two hinges.
   2. Doors From 60 inches High up to 90 inches High: Three hinges.

H. Manufacturers: Subject to compliance with the specifications, available manufacturers include:
   1. Assa Abloy McKinney.
   2. Hager Companies.
   3. Stanley Hardware.
   4. Substitutions: See Division 1 General Requirements.

2.04 LOCKS AND LATCHES

A. Strikes: Provide manufacturer's standard wrought box strike for each latch or lock bolt, with curved lip extended to protect frame, finished to match hardware set.
   1. Provide flat-lip strikes for locks with three-piece, antifriction latchbolts as recommended by the manufacturer.

B. Locks: Provide a lock for every door, unless specifically indicated as not requiring locking.
   1. Hardware Sets indicate locking functions required for each door.
   2. If no hardware set is indicated for a swinging door provide an office lockset.
   3. Trim: Provide lever handle or pull trim on outside of all locks unless specifically stated to have no outside trim.
   4. Lock Cylinders: Provide key access on outside of all locks unless specifically stated to have no locking or no outside trim.

C. Lock Cylinders: Manufacturer’s standard tumbler type, small format, interchangeable core. Provide construction cores. **Rekey all locks at the completion of the project if construction core is omitted.**
   1. Provide cams and/or tailpieces as required for locking devices required.
   2. Metals: Construct lock cylinder parts from brass or bronze, stainless steel or nickel silver.

D. High Security Lock Cylinders: Where indicated in the “Hardware Sets” at the end of this Section, provide high security cylinders with 7-pin, interchangeable core and keyed into the existing factory registered Key System with a restricted keyway.

E. Keying: Provide grandmasterkey and minimum of three different masterkeys to correspond to owner’s existing keying system. Except as otherwise indicated, provide individual change key for each lock that is not designated to be keyed alike with a group of related locks.
   1. Provide visual key control with identifying key symbol stamped on the key and the plug or cylinder face. Inscribe each key with the notation "DO NOT DUPLICATE".
   2. Supply keys in the following quantities:
      a. 5 keys for each lockset
      b. 5 master keys for each master system.
      c. 5 grand master keys for each grandmaster system.

3. Furnish one extra blank for each lock.
4. When providing keying information, comply with DHI Handbook "Keying systems and nomenclature".
5. Key Material: Nickel silver only.
6. Owner's Key System: Masterkey keys to Owner's factory- keyed, Best MX-8 Patented system.

F. Latches: Provide a latch for every door that is not required to lock, unless specifically indicated "push/pull" or "not required to latch".

G. Lock Throw: Provide 5/8 inch minimum throw of latch on pairs of doors. Comply with UL requirements for throw of bolts and latch bolts on fire rated openings.

H. Levers: Lever trim shall be vandal-resistant, providing for free rotation of the lever in the locked position.

I. Flush Bolt Heads: Minimum 12 inch long rod for doors up to 7'-0" in height, and longer rods for doors exceeding 7'-0" in height.

J. Manufacturers: Subject to compliance with the specifications, available manufacturers include:
1. Assa Abloy Corbin Russwin or Yale.
2. Best Access Systems, division of Stanley Security Solutions.
3. Schlage.
4. Substitutions: See Division 1 General Requirements.

2.05 CLOSERS

A. Closers: Complying with BHMA A156.4.
1. Provide surface-mounted, door-mounted closers unless otherwise indicated.
2. Provide parallel arms for all overhead closers, unless specifically otherwise indicated.
3. Provide a door closer on every exterior door.
4. Provide a door closer on every fire- and smoke-rated door. Spring hinges are not an acceptable self-closing device unless specifically so indicated.
5. On pairs of swinging doors, if an overlapping astragal is present, provide coordinator to ensure the leaves close in proper order.
6. Coordinate selection and installation of closers with door head, frame head, hold opens and weatherstripping to ensure proper installation and operation of all door hardware items.
7. Provide grey resilient parts for exposed bumpers.

B. Access-Free Manual Closers: Where manual closers for doors are indicated for doors required to be accessible to the physically handicapped, provide adjustable units in conformance with ANSI A117.1 and the Americans With Disabilities Act for door opening force.

C. Unit Size: Except as otherwise specifically indicated, comply with manufacturer's recommendations for size of door control unit depending on door size, exposure to weather and anticipated frequency of use.
1. Where parallel arms are indicated, provide closer unit one size larger than recommended for use with standard arms.

D. Manufacturers: Subject to compliance with the specifications, available manufacturers include:
1. Assa Abloy Corbin Russwin.
2. LCN.
3. Stanley Hardware.
4. Substitutions: See Division 1 General Requirements.

2.06 STOPS AND HOLDERS

A. Stops: Complying with BHMA A156.8; provide a stop for every swinging door, unless otherwise indicated.
1. Provide wall stops, unless otherwise indicated.
2. If wall stops are not practical, due to configuration of room or furnishings, provide overhead stop.

3. Stop is not required if positive stop feature is specified for door closer; positive stop feature of door closer is not an acceptable substitute for a stop unless specifically so stated.

B. Locate wall stops on solid surfaces wherever possible. Overhead stops shall be installed in lieu of wall stops in every instance where wall stops are specified if blocking has not been coordinated with the stud wall installer.

C. Overhead Holders/Stops: Coordinate selection and installation of holders/stops with door head, frame head, closers and weatherstripping to ensure proper installation and operation of all door hardware items.

D. Door Silencers: Provide three door silencers for strike jamb of single door frames, and four silencers on heads of double door frames, unless frame is weatherstripped. Basis of design is Rockwood #608 for hollow metal frames and Rockwood #609 for wood frames.

E. Manufacturers - Overhead Holders/Stops: Subject to compliance with the specifications, available manufacturers include:
1. Assa Abloy Rixson.
2. Architectural Builders Hardware Mfg., Inc (ABH)..
3. Glynn-Johnson: www.glynn-johnson.com.
4. Substitutions: See Division 1 General Requirements.

F. Manufacturers - Wall Stops/Holders: Subject to compliance with the specifications, available manufacturers include:
1. Assa Abloy Rixson or Rockwood.
2. Burns Manufacturing Inc.
3. Ives.
4. Substitutions: See Division 1 General Requirements.

G. Manufacturers - Door Silencers: Subject to compliance with the specifications, available manufacturers include:
1. Assa Abloy [Rockwood].
2. Burns Manufacturing Inc.
3. Ives.

2.07 GASKETING AND THRESHOLDS

A. Provide continuous weatherstripping, threshold and sweep for every exterior door. Provide items to match similar specified opening if weatherstripping, threshold or sweep have been omitted from the schedule for any exterior door.

B. Gaskets: Complying with BHMA A156.22.
1. On each door in smoke partition, provide smoke gaskets; top, sides, and meeting stile of pairs. If fire/smoke partitions are not indicated on drawings, provide smoke gaskets on each door identified as a "smoke door" and 20-minute rated fire doors.
2. On wood doors with fire rating more than 20-minutes, provide frame-applied intumescent gaskets.
3. On each exterior door, provide door bottom sweep to contact threshold, unless otherwise indicated.
4. On doors indicated as "sound-rated", "acoustical", or with an STC rating, provide sound-rated gaskets and automatic door bottom; make gaskets completely continuous, do not cut or notch gaskets for installation.
5. On doors indicated as "lightproof", provide gaskets similar to smoke gaskets.
6. Replaceable Seal Strips: Provide only those units where resilient or flexible seal strip is easily replaceable and readily available from sticks maintained by the manufacturer.
7. Coordinate selection and installation of weatherstripping with strike plates, exit devices, closers and hold-opens to ensure proper installation and operation of all door hardware.

A. Thresholds: Provide thresholds, complying with ICC A117.1-2009, of required size and design shown in the schedule. Cut thresholds around door stops for a tight fit to hollow metal frames. Set threshold in two beads of polyurethane caulk and caulk both ends to door jambs.

1. Provide units not less than 4 inches wide, formed to accommodate change in floor elevation where indicated, fabricated to accommodate door hardware and to fit door frames.
2. Shop cut thresholds to fit tight to face of door frame.

B. Fasteners At Exterior Locations and as required elsewhere: Non-corroding.

C. Manufacturers: Subject to compliance with the specifications, available manufacturers include:
1. National Guard Products, Inc.
2. Pemko Manufacturing Co.
3. Reese Enterprises, Inc.
4. Substitutions: See Division 1 General Requirements.

2.08 PROTECTION PLATES AND ARCHITECTURAL TRIM

A. Protection Plates: Provide plates of not more than 1-1/2 inches less than door width on hinge side and not more than 1/2 inch less than door width on pull side, height as indicated.
1. Kickplate: Provide on push side of every door with closer, except storefront and all-glass doors.
2. Mop Plates: Provide where noted.
3. Fasteners: Provide manufacturer's standard exposed fasteners for door trim units consisting of either machine screws or self-tapping screws.

B. Fabricate plates of material indicated.

C. Drip Guard: Provide projecting drip guard over all exterior doors unless they are under a projecting roof or canopy.

D. Manufacturers: Subject to compliance with the specifications, available manufacturers include:
1. Assa Abloy Rockwood.
2. Burns Manufacturing Inc.
3. Ives.
4. Substitutions: See Division 1 General Requirements.

2.09 KEY CONTROLS

A. Key Management System: For each keyed lock on project, provide one set of consecutively numbered duplicate key tags with hanging hole and snap catch.
1. Security Key Tags: For each keyed lock on project, provide one set of matching key tags for permanent attachment to one key of each set.
2. Provide key collection envelopes, labels, tags, receipt forms, 3-way visible card index, index cards, temporary markers and permanent markers, all as recommended by the system manufacturer, with capacity for 120 percent of the number of locks required for the Project.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that doors and frames are ready to receive work; labeled, fire-rated doors and frames are present and properly installed, and dimensions are as indicated on shop drawings.

B. Verify that electric power is available to power operated devices and of the correct characteristics.

3.02 INSTALLATION

A. Install hardware in accordance with manufacturer's instructions and applicable codes.

B. Use templates provided by hardware item manufacturer.

C. Use only manufacturer’s supplied fasteners for installation of hardware. Lost or damaged fasteners, strikes etc. shall be replaced with original equipment. Maintain possession of all spare fasteners and parts and deliver same to the owner upon completion of the work.

D. Do not install surface mounted items until finishes applied to substrate are complete.

E. Set units level, plumb and true to line and location. Adjust and reinforce substrate as necessary for proper installation and operation.

F. Drill and countersink units that are not factory prepared for anchorage fasteners. Space fasteners and anchors in accordance with industry standards.

G. Set thresholds for exterior doors in full bed of butyl rubber or polyisobutylene mastic sealant complying with requirements in Division 7 section "Joint Sealers".

H. After fitting and hanging doors, remove doors so that top and bottom edges can be painted, and rehang after painting is complete.

I. Mounting heights for hardware from finished floor to center line of hardware item: As listed in Schedule, unless otherwise noted:
   1. For steel doors and frames: Comply with DHI "Recommended Locations for Architectural Hardware for Steel Doors and Frames."
   2. As required by accessibility codes and in conformance with the requirements of the Americans With Disabilities Act.

J. Instruct Owner's designated representatives in the adjustment and maintenance of door hardware and hardware finishes. Deliver to the Owner's designated representatives all installation and adjusting tools, instructions and templates, and a copy of the Final Hardware Schedule.

K. Verify with the Architect the instructions for delivery of permanent keys to the Owner. Manufacturer shall deliver keys and cores directly to the Owner's designated representative and shall provide the Architect with a signed receipt for the keys. Under no circumstances are permanent keys to be delivered to the Contractor. Keys shall be properly indexed and filed in Key Cabinet prior to delivery to the Owner.

L. Hardware Supplier shall provide and install temporary hardware for security and convenience of the Owner if shipment of the permanent hardware would cause delays in construction or use of the building by the Owner.

3.03 FIELD QUALITY CONTROL

A. The Hardware Supplier shall remove the construction cores when advised by the Architect.

B. Upon completion of the work, the Hardware Supplier, in the presence of the Installer, shall examine the hardware installation and note any improper installation or required adjustments. When he is satisfied that all hardware has been properly installed and adjusted, the Supplier shall certify in writing to the Architect that the hardware has been installed in accordance with the intent of the drawings and the manufacturer's recommendations.

3.04 ADJUSTING

A. Adjust hardware for smooth operation. Replace units that cannot be adjusted to operate freely and smoothly or as intended for the application.

B. Adjust gasketing for complete, continuous seal; replace if unable to make complete seal.

C. Access-Free Closers: Adjust manual closers for doors required to be accessible to the physically handicapped as required by accessibility codes and in conformance with ANSI A117.1 and the Americans With Disabilities Act for door opening force and delayed action closing.

3.05 CLEANING

A. Clean adjacent surfaces soiled by hardware installation. Clean finished hardware per manufacturer's instructions after final adjustments has been made. Replace items that cannot be cleaned to manufacturer's level of finish quality at no additional cost.

3.06 PROTECTION

A. Do not permit adjacent work to damage hardware or finish.

3.07 FINAL ADJUSTMENT

A. Eleven-Month Adjustment: Approximately eleven months after the date of Substantial Completion, the Installer, accompanied by a representative of the Supplier, shall return to the Project to perform the following work:
   1. Examine and readjust each item of door hardware as necessary to restore full function of doors and hardware.
   2. Consult with the Owner's designated representative in recommended additions to the maintenance procedures.
   3. Replace hardware items that have deteriorated or failed due to faulty design, materials or installation of hardware units.
   4. Prepare a written report of current and predictable problems (of substantial nature) in the performance of the hardware.

PART 4 HARDWARE SETS

4.01 GENERAL

A. General: Provide hardware for each door to comply with the requirements of this specification, including the following schedule of hardware sets, and the hardware set numbers indicated on the Drawings.

B. Hardware Supplier shall check the plans and be responsible for quantities, hands of doors, and other details including adaptability of all items of hardware. Hardware Supplier shall be responsible for coordinating the various hardware items, making sure that types and styles submitted are mechanically compatible.

4.02 SCHEDULE OF HARDWARE SETS

HW-1 Doors 1, 3, 5 & 7
All Hardware provided by Door Manufacturer.

HW-2	**Door 2, 4 & 8**		
1 ½ pr.	Hinges	Stanley FBB179 x US26D	US32D
1	Lockset	Corbin Russwin ML 2053 Lustra LSB	US26D
1	Closer	LCN 4111 Spring-Cush Arm	AL
1	Threshold	NG 613 (36” cut to match profile of jamb)	Al
1	Kick Plate	Rockwood 6”x34” #K1062 B4E	US26D
1 Set	Weatherstrip	NG 130NDkB	
1	Sweep	NG C627NDkB	

HW-3	**Door 6**		
1 ½ pr.	Hinges	Stanley FBB179 x US26D	US26D
1	Lockset	Corbin Russwin ML 2003 Lustra LSB	US26D
1	Overhead Stop	GJ453S	US32D
2	Door Protection Plates	Rockwood 30"x34" # K1062 B4E	US26D
3	Door Silencers	Burns 500	grey

HW-4 Provide six masterkeyed padlocks in addition to hardware listed above.

END OF SECTION

SECTION 08 8000
GLAZING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Glass in doors.

B. Glazing compounds and accessories.

1.02 RELATED REQUIREMENTS

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

B. Section 01 7800 - Closeout Submittals.

C. Section 08 1113 - Hollow Metal Doors and Frames: Glazed doors and borrowed lites.

1.03 SYSTEM PERFORMANCE REQUIREMENTS

A. General: Provide glazing systems that are produced, fabricated, and installed to withstand normal thermal movement and impact loading (where applicable), without failure including loss or glass breakage attributable to the following: defective manufacture, fabrication, and installation; failure of sealants or gaskets to remain watertight and airtight; deterioration of glazing materials; and other defects in construction.

B. Glass Design: Glass thicknesses indicated on Drawings are for detailing only. Confirm glass thicknesses by analyzing Project loads and in-service conditions.
   1. Glazing for Aluminum Windows: Coordinate with performance classification and grade specified in Section 08 5113.

1.04 SUBMITTALS

A. See General and Supplementary General Conditions for submittal procedures.

B. Product Data on Glass Types: Provide structural, physical and environmental characteristics, size limitations, special handling or installation requirements.

C. Product Data on Glazing Compounds: Provide chemical, functional, and environmental characteristics, limitations, special application requirements. Identify available colors.

D. Specimen Warranty.

E. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

1.05 QUALITY ASSURANCE

A. Perform Work in accordance with GANA Glazing Manual and FGMA Sealant Manual for glazing installation methods, except where more stringent requirements are indicated. Refer to these publications for glazing terms not otherwise defined in this Section or in referenced standards.

B. Insulating Glass Certification Program: Provide insulating glass units permanently marked either on spacers or at least one component lite of units with appropriate certification label of inspecting and testing agency indicated below:
   1. Insulating Glass Certification Council (IGCC).

C. Installer Qualifications: Company specializing in performing the work of this section Engage an experienced glazier who has completed glazing similar in material, design, and extent to that indicated for Project with a record of successful in-service performance.

D. Single-Source Responsibility for Glass: Obtain primary glass of each (ASTM C 1036) type and class indicated from one source for each product.

E. Single-Source Responsibility for Glazing Accessories: Obtain glazing accessories from one source for each product and installation method indicated.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Protect glazing materials to comply with manufacturer's directions and as needed to prevent damage to glass and glazing materials from condensation, temperature changes, direct exposure to sun, or other causes.

1.07 WARRANTY

A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.

B. Warranty period commences on date of Final Acceptance of the work or Beneficial Occupancy.

C. Manufacturer's Warranty on Coated Glass Products: Submit written warranty signed by coated glass manufacturer agreeing to furnish replacements for those coated glass units that deteriorate, f.o.b. point of manufacture, freight allowed Project site, within 10 years after project acceptance. Warranty covers only deterioration due to normal conditions of use and not to handling, installing, and cleaning practices contrary to glass manufacturer's published instructions.

D. Sealed Insulating Glass Units: Provide a ten (10) year warranty to include coverage for seal failure, interpane dusting or misting, including replacement of failed units.

PART 2 PRODUCTS

2.01 GLASS MATERIALS

A. Float Glass: Annealed Type, ASTM C 1036, Type I (transparent flat), Class 1 (clear), Quality Q3 (glazing select). All glazing is to be float glass unless otherwise indicated.
   1. Thicknesses: As indicated, 1/4 inch minimum for interior single glazing. For exterior glazing comply with specified requirements for wind load design regardless of specified thickness.
   2. Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated in the Work include, but are not limited to the following:
      a. AGC Flat Glass North America, Inc.
      b. Guardian Industries Corp.
      c. Pilkington North America Inc.
      d. PPG Industries, Inc.
      e. Saint-Gobain North America.
      f. Substitutions: See General Conditions.

B. Safety Glazing: Uncoated, clear, heat-treated float glass. **Safety glazing is required in all frames in or adjacent to swinging doors**.
   1. Heat-Strengthened and Fully Tempered Types: ASTM C 1048, Condition A (uncoated surface), Type I (transparent glass, flat), Quality q3 (glazing select).
   2. Type: Class 1 (clear) unless otherwise noted.
   3. Impact Resistance: Compliant with CPSC 16-CFR, Part 1201.
      a. Comply with Category I for lights of 9 square feet and less.
      b. Comply with Category II for lights of over 9 square feet.
   4. Impact Resistance, Alternate Compliance: In lieu of 16-CFR, Part 1201 compliance, comply with ANSI Z97.1.
      a. Comply with Category A.
   5. Thicknesses: As indicated, 1/4 inch minimum for interior single glazing. For exterior glazing comply with specified requirements for wind load design regardless of specified thickness.
   6. Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated in the Work include, but are not limited to the following:
      a. AGC Flat Glass North America, Inc.
      b. Guardian Industries Corp.
      c. Pilkington North America Inc.

d. PPG Industries, Inc.
e. Saint-Gobain North America.
f. Substitutions: See General Conditions.

2.02 EXTERIOR GLAZING ASSEMBLIES

A. Air and Vapor Seals: Provide completed assemblies that maintain continuity of building enclosure vapor retarder and air barrier:
1. In conjunction with vapor retarder and joint sealer materials described in other sections.
2. To maintain a continuous air barrier and vapor retarder throughout the glazed assembly from glass pane to heel bead of glazing sealant.

2.03 SEALED INSULATING GLASS UNITS

A. Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated in the Work include, but are not limited to the following:
1. Any of the manufacturers specified for float glass.
2. Cardinal Glass Industries.
3. PPG.
4. Viracon, Apogee Enterprises, Inc.
5. Substitutions: See General Conditions.

B. General: Provide preassembled permanently sealed insulating glass units complying with ASTM E2190.
1. Edge Spacers: Warm edge spacer, steel with bent and spot welded corners.
2. Edge Seal: Glass to elastomer with supplementary silicone sealant.

C. Insulating Safety Glass: Low-E vision glazing units. **Safety glazing is required in all frames in or adjacent to swinging doors**.
1. Basis of Design: Solarban 70XL, PPG.
2. Between-lite space filled with dry hermetic air.
3. Total Visible Light Transmittance: 64 percent.
4. Outdoor Visible Reflectance: 12 percent.
5. Thermal Resistance (U-Value): 0.33 winter and summer, nominal, center of glass.
6. Total Solar Heat Gain Coefficient: 0.33, nominal, center of glass.
7. Outboard Lite: Safety glazing, 6 mm thick, minimum.
a. Tint: Clear.
b. Coating: Low-E type, on #2 surface.
c. Coating: Highly reflective type, on #2 surface.
8. Inboard Lite: Safety glazing, 6 mm thick.
a. Tint: Clear.
9. Total Thickness: 1 inch nominal.

2.04 GLAZING COMPOUNDS

A. Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated in the Work include, but are not limited to the following:
1. Bostik Inc.
2. Momentive Performance Materials, Inc (formerly GE Silicones).
3. Pecora Corporation.
4. BASF Construction Chemicals-Building Systems.
5. Substitutions: See General Conditions.

B. General: Provide products of type indicated, complying with the following requirements:
1. Compatibility: Select glazing sealants and tapes of proven compatibility with other materials they will contact under conditions of installation and service, as demonstrated by testing and field experience.
2. Suitability: Comply with sealant and glass manufacturer's recommendations for selecting glazing sealants and tapes that are suitable for applications indicated and conditions existing at time of installation.

3. Colors: Provide selections made by Architect from manufacturer's full range of standard colors for products of type indicated.

C. Elastomeric Glazing Sealant Standard: Provide manufacturer's standard chemically curing, elastomeric sealants of base polymer indicated that comply with ASTM C 920 requirements.

2.05 GLAZING ACCESSORIES

A. General: Provide products of material, size, and shape complying with referenced glazing standard, requirements of manufacturers of glass and other glazing materials involved for glazing application indicated, and with a proven record of compatibility with surfaces contacted in installation.

B. Cleaners, Primers and Sealers: Type recommended by sealant or gasket manufacturer.

C. Edge Blocks: Elastomeric material of hardness needed to limit glass lateral movement (side-walking).

D. Plastic Foam Joint Fillers: Preformed, compressible, resilient, nonstaining, nonextruding, non-outgassing, strips of closed-cell plastic foam of density, size, and shape to control sealant depth and otherwise contribute to produce optimum sealant performance.

E. Setting Blocks: Neoprene, 80 to 90 Shore A durometer hardness, ASTM C 864 Option I. Length of 0.1 inch for each square foot of glazing or minimum 4 inch x width of glazing rabbet space minus 1/16 inch x height to suit glazing method and pane weight and area. Compatible with edge seal of insulating glass units. Notched, to allow water in glazing pocket to drain to weeps.

F. Spacer Shims: Neoprene, 50 to 60 Shore A durometer hardness, ASTM C 864 Option I. Minimum 3 inch long x one half the height of the glazing stop x thickness to suit application, self adhesive on one face.

G. Glazing Tape: Preformed butyl-based elastomeric compound with integral resilient tube spacing device; 10 to 15 Shore A durometer hardness; nonstaining and nonmigrating in contact with nonporous surfaces, packaged on release paper backing; black color. Comply with AAMA 800.
   1. Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated in the Work include, but are not limited to the following:
      a. Pecora Corporation.
      b. Schnee Morehead.
      c. Tremco Global Sealants.
      d. Substitutions: See General Conditions.

H. Glazing Gaskets: Resilient silicone extruded shape to suit glazing channel retaining slot; ASTM C 864 Option I.
   1. Color: As selected from manufacturer’s standards.

I. Glazing Clips: Manufacturer's standard type.

PART 3 EXECUTION

3.01 EXAMINATION

A. Aerify that openings for glazing are correctly sized and within tolerance.

B. Verify that surfaces of glazing channels or recesses are clean, free of obstructions that may impede moisture movement, weeps are clear, and ready to receive glazing.

3.02 PREPARATION

A. Clean contact surfaces with solvent and wipe dry.

B. Seal porous glazing channels or recesses with substrate compatible primer or sealer.

C. Prime surfaces scheduled to receive sealant.

D. Install sealants in accordance with ASTM C 1193 and FGMA Sealant Manual.

E. Install sealant in accordance with manufacturer's instructions.

3.03 GLAZING, GENERAL

A. Comply with combined recommendations of manufacturers of glass, sealants, gaskets, and other glazing materials, except where more stringent requirements are indicated, including those in referenced glazing publications.

B. Glazing channel dimensions as indicated on Drawings provide necessary bite on glass, minimum edge and face clearances, and adequate sealant thicknesses, with reasonable tolerances. Adjust as required by Project conditions during installation.

C. Protect glass from edge damage during handling and installation as follows:
   1. Use a rolling block in rotating glass units to prevent damage to glass corners. Do not impact glass with metal framing. Use suction cups to shift glass units within openings; do not raise or drift glass with a pry bar. Rotate glass lites with flares or bevels on bottom horizontal edges so edges are located at top of opening, unless otherwise indicated by manufacturer's label.
   2. Remove damaged glass from Project site and legally dispose of off site. Damaged glass is glass with edge damage or other imperfections that, when installed, weaken glass and impair performance and appearance.

D. Apply primers to joint surfaces where required for adhesion of sealants, as determined by preconstruction sealant-substrate testing.

E. Install elastomeric setting blocks in sill rabbets, sized and located to comply with referenced glazing standard, unless otherwise required by glass manufacturer. Set blocks in thin course of compatible sealant suitable for heel bead.

F. Do not exceed edge pressures stipulated by glass manufacturers for installing glass lites.

G. Provide spacers for glass sizes larger than 50 united inches (length plus height) as follows:
   1. Locate spacers inside, outside, and directly opposite each other. Install correct size and spacing to preserve required face clearances, except where gaskets and glazing tapes are used that have demonstrated ability to maintain required face clearances and comply with system performance requirements.
   2. Provide 1/8-inch minimum bite of spacers on glass and use thickness equal to sealant width. With glazing tape, use thickness slightly less than final compressed thickness of tape.

H. Provide edge blocking to comply with requirements of referenced glazing publications, unless otherwise required by glass manufacturer.

I. Set glass lites in each series with uniform pattern, draw, bow, and similar characteristics.

3.04 FACTORY GLAZING

A. Refer to Section 08 1113 for glazing of hollow metal doors and frames.

3.05 WET/DRY GLAZING, TAPE AND SEALANT

A. Position tapes on fixed stops so that when compressed by glass their exposed edges are flush with or protrude slightly above sightline of stops.

B. Install tapes continuously but not in one continuous length. Do not stretch tapes to make them fit opening.

C. Where framing joints are vertical, cover these joints by applying tapes to heads and sills first and then to jambs. Where framing joints are horizontal, cover these joints by applying tapes to jambs and then to heads and sills.

D. Place joints in tapes at corners of opening with adjoining lengths butted together, not lapped. Seal joints in tapes with compatible sealant approved by tape manufacturer.

E. Do not remove release paper from tape until just before each lite is installed.

F. Apply heel bead of elastomeric sealant.

3.06 WET GLAZING (SEALANT AND SEALANT)

A. Install glazing resting on setting blocks and install applied stop

B. Center pane by use of continuous spacer shims between glass lites and glazing stops, kept 1/4 inch below sight line, to maintain glass face clearances and to prevent sealant from extruding into glass channel weep systems until sealants cure. Secure spacers in place and in position to control depth of installed sealant relative to edge clearance for optimum sealant performance.

C. Locate and secure glazing pane using glazers' clips.

D. Force sealants into glazing channels to eliminate voids and to ensure complete wetting or bond of sealant to glass and channel surfaces.

E. Tool exposed surfaces of sealants to provide a substantial wash away from glass. Install pressurized gaskets to protrude slightly out of channel to eliminate dirt and moisture pockets.

3.07 PROTECTION AND CLEANING

A. Protect exterior glass from breakage immediately after installation by attaching crossed streamers to framing held away from glass. Do not apply markers to glass surface. Remove nonpermanent labels, and clean surfaces.

B. Remove glazing materials from finish surfaces

C. Protect glass from contact with contaminating substances resulting from construction operations including weld splatter. If, despite such protection, contaminating substances do come into contact with glass, remove them immediately as recommended by glass manufacturer.

D. Examine glass surfaces adjacent to or below exterior concrete and other masonry surfaces at frequent intervals during construction, but not less than once a month, for build-up of dirt, scum, alkali deposits, or stains, and remove as recommended by glass manufacturer.

E. Remove and replace glass that is broken, chipped, cracked, abraded, or damaged in any way, including natural causes, accidents and vandalism, during construction period.

F. Wash glass on both faces in each area of Project not more than 4 days prior to date scheduled for inspections that establish date of Substantial Completion. Wash glass as recommended by glass manufacturer.

END OF SECTION

SECTION 09 2116
GYPSUM BOARD ASSEMBLIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Metal furring.

B. Glass fiber reinforced gypsum sheathing.

C. Gypsum wallboard.

D. Joint treatment and accessories.

1.02 RELATED REQUIREMENTS

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

B. Section 05 4000 - Cold-Formed Metal Framing: Exterior wind-load-bearing metal stud framing.

C. Section 07 2500 - Weather Barriers: Water-resistive barrier over exterior wall sheathing.

D. Section 07 9000 - Joint Sealers.

1.03 SUBMITTALS

A. See General and Supplementary General Conditions for submittal procedures.

B. Product Data: Provide data on metal framing, gypsum board, accessories, and joint finishing system.

C. Qualification Data: Indicating compliance with Quality Assurance Article.

1.04 QUALITY ASSURANCE

A. Single Source Responsibility for Gypsum Products: Obtain each type of gypsum panel product from a single manufacturer.

B. Installer Qualifications: Company specializing in performing work similar in type and scope to that required for use on this Project, with minimum 5 years of documented experience.

1.05 FIELD CONDITIONS

A. Maintain environmental conditions for applying and finishing gypsum board to comply with ASTM C 840 requirements or gypsum board manufacturer's recommendations, whichever are more stringent.

B. Maintain uniform temperature of minimum 40 degrees F. Ventilate building spaces as required to dry joint treatment materials.

PART 2 PRODUCTS

2.01 GYPSUM BOARD ASSEMBLIES

A. Provide completed assemblies complying with ASTM C 840 and GA-216.

2.02 METAL FRAMING MATERIALS

A. Manufacturers - Metal Accessories: Subject to compliance with the specifications, available manufacturers include:
   1. ClarkDietrich Building Systems LLC.
   2. Marino/Ware.
   3. Scafco Steel Stud Co.
   4. The Steel Network, Inc.
   5. Substitutions: See General Conditions.

B. Non-Loadbearing Framing System Components: ASTM C 645; galvanized sheet steel, of size and properties necessary to comply with ASTM C 754 for the spacing indicated, with maximum deflection of wall framing of L/240 at 5 psf.
   1. Z-Furring Members: With slotted or non-slotted web, minimum uncoated thickness 0.0179 inch. Face flange 1-1/4 inch, attachment flange 7/8 inch, depth required to accommodate specified insulation.

2.03 BOARD MATERIALS

A. Abuse-Rated Wallboard: Paper-faced or glass mat-faced gypsum panels, sizes to minimize joints in place.
   1. Application: Areas indicated in finish schedule.
   2. Paper-Faced Type: Gypsum wallboard as defined in ASTM C 1396/C 1396M, suitable for paint finish.
   3. Glass-Mat Faced Type: Glass-mat-faced gypsum panels as defined in ASTM C 1658/C 1658M, suitable for paint finish.
   4. Mold Resistance: Score of 10, when tested in accordance with ASTM D 3273.
   5. Surface Abrasion: Tested to Level 3 in accordance with ASTM C 1629.
   6. Surface Indentation: Tested to Level 1 in accordance with ASTM C 1629.
   7. Impact Resistance: Tested to Level 2 soft-body and Level 1 hard-body impact in accordance with ASTM C 1629.
   8. Thickness: 5/8 inch.
   9. Edges: Tapered.
   10. Paper-Faced Products: Subject to compliance with the specifications, available products include, but are not limited to:
      a. Certainteed Corporation, AirRenew M2Tech Extreme Abuse.
      b. Lafarge North America, Inc; Protecta AR 100.
      c. National Gypsum Company; Gold Bond Brand Hi-Abuse XP Wallboard.
      d. Substitutions: See General Conditions.
   11. Glass Mat-Faced Products: Subject to compliance with the specifications, available products include, but are not limited to:
      a. Georgia-Pacific Gypsum LLC; DensArmor Plus Abuse-Resistant.
      b. National Gypsum Company; Gold Bond e2XP Interior Extreme AR.
      c. Substitutions: See General Conditions.

B. Exterior Sheathing Board: Sizes to minimize joints in place; ends square cut.
   1. Application: Exterior sheathing, unless otherwise indicated.
   2. Mold Resistance: Score of 10, when tested in accordance with ASTM D 3273.
   3. Glass-Mat-Faced Sheathing: Glass mat faced gypsum substrate as defined in ASTM C 1177/C 1177M.
   4. Core Type: Regular.
   5. Regular Board Thickness: 1/2 inch.
   6. Edges: Square, for vertical application.
   7. Surfacing: Glass mat on face, back and long edges.
   8. Racking Strength:
      a. Regular: Not less than 540 pounds per square foot, dry, ultimate strength per ASTM E72.
   9. Flexural Strength: 80 pounds per linear foot, parallel, per ASTM C473.
   10. Humidified Deflection:
      a. Regular: 2/8 inch maximum per ASTM C1177.
   11. Permeance: 23 perms per ASTM E96.
   12. R-Value: 0.56 minimum per ASTM C518.
   13. Mold Resistance: 10, in a test as manufactured, per ASTM D3273.
   14. Microbial Resistance: Will not support microbial growth per ASTM D6329, GREENGUARD 3-week protocol.

15. Glass-Mat-Faced Products: Subject to compliance with the specifications, available products include:
    a. CertainTeed Corporation; GlasRoc Brand.
    b. Georgia-Pacific Gypsum LLC; DensGlass Gold Sheathing.
    c. National Gypsum Company; Gold Bond Brand e2XP Extended Exposure Sheathing.
    d. Substitutions: See General Conditions.

2.04 ACCESSORIES

A. Water-Resistive Barrier: As specified in Section 07 2500.

B. Finishing Accessories: ASTM C 1047, galvanized steel or rolled zinc, unless otherwise indicated.
   1. Types: As detailed or required for finished appearance.
   2. Special Shapes: As indicated below:
      a. Cornerbead at outside corners, unless otherwise indicated.
      b. LC-bead at exposed corners.
      c. Tapered fin drywall reveal where gypsum board assemblies abut dissimilar materials.

C. Joint Materials: ASTM C 475 and as recommended by gypsum board manufacturer for project conditions.
   1. Tape: 2 inch wide, coated glass fiber mesh tape for joints and corners, except as otherwise indicated.
   2. Ready-mixed vinyl-based joint compound.
   3. Chemical hardening type compound.

D. Screws for Attachment to Steel Members Less Than 0.03 inch In Thickness, and to Gypsum Board: ASTM C 1002; self-piercing tapping type; cadmium-plated for exterior locations.

E. Screws for Attachment to Steel Members From 0.033 to 0.112 inch in Thickness: ASTM C 954; steel drill screws for application of gypsum board to loadbearing steel studs.

F. Screws for Attachment of Exterior Sheathing: ASTM C 954, steel drill screws, Type S-12 fluted tip, minimum 1-1/4 inch long, with organic polymer coating or other corrosion-resistant coating.

G. Touch-Up Paint: ASTM A 780, for repair of damaged and uncoated areas of hot dip galvanized coatings.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that project conditions are appropriate for work of this section to commence.

3.02 WALL FRAMING INSTALLATION

A. Metal Framing: Install in accordance with ASTM C 754 and manufacturer's instructions.

B. Standard Wall Furring: Install at new walls where indicated on the drawings. Secure in place on alternate channel flanges at maximum 24 inches on center.
   1. Orientation: Horizontal.
   2. Spacing: As indicated.

3.03 BOARD INSTALLATION

A. Comply with ASTM C 840, GA-216, and manufacturer's instructions. Install to minimize butt end joints, especially in highly visible locations.

B. Single-Layer Non-Rated: Install gypsum board perpendicular to framing or furring, with ends and edges occurring over firm bearing. Stagger abutting end joints not less than one framing member. Stagger joints on opposite sides of partitions.
   1. On partitions/walls, apply gypsum panels horizontally (perpendicular to framing), unless parallel application is required for fire-resistance-rated assemblies. Use maximum-length panels to minimize end joints.

C. Perimeter Isolation: Isolate perimeter of nonload-bearing gypsum board partitions at structural abutments, except floors. Provide 1/4- to 1/2-inch- wide spaces at these locations and trim edges with U-bead edge trim where edges of gypsum panels are exposed. Seal joints between edges and abutting structural surfaces with acoustical sealant.

D. Penetrations: Fit gypsum panels around ducts, pipes, and conduits.

E. Exterior Sheathing: Comply with ASTM C 1280. Install sheathing vertically, with edges butted tight and ends occurring over firm bearing.
   1. Paper-Faced Sheathing: Immediately after installation, protect from weather by application of water-resistive barrier.
   2. Provide inlet diagonal bracing at corners.

F. Installation on Metal Framing: Use screws for attachment of all gypsum board, unless otherwise noted. For multi-layer assemblies, fasten each layer separately to supports.

G. Moisture Protection: Treat cut edges and holes in moisture resistant gypsum board and exterior gypsum soffit board with sealant.

3.04 INSTALLATION OF TRIM AND ACCESSORIES

A. Control Joints: Place control joints consistent with lines of building spaces and as indicated.
   1. Not more than 30 feet apart on walls and ceilings over 50 feet long.
   2. At exterior soffits, not more than 30 feet apart in both directions.

B. Corner Beads: Install at external corners, using longest practical lengths.

C. Edge Trim: Install at locations where gypsum board abuts dissimilar materials and as indicated.

3.05 JOINT TREATMENT

A. Glass Mat Faced Gypsum Board: Use fiberglass joint tape, bedded and finished with chemical hardening type joint compound.

B. Exterior Sheathing: Use fiberglass joint tape with sealants recommended by weather barrier manufacturer.

C. Paper Faced Gypsum Board: Use fiberglass joint tape, bedded with ready-mixed vinyl-based joint compound and finished with ready-mixed vinyl-based joint compound.

D. Finish gypsum board in accordance with levels defined in ASTM C 840, as follows:
   1. Level 4: Walls and ceilings to receive paint finish or wall coverings, unless otherwise indicated.

E. Tape, fill, and sand exposed joints, edges, and corners to produce smooth surface ready to receive finishes.
   1. Feather coats of joint compound so that camber is maximum 1/32 inch.

3.06 CLEANING AND PROTECTION

A. Promptly remove any residual joint compound from adjacent surfaces.

3.07 TOLERANCES

A. Maximum Variation of Finished Gypsum Board Surface from True Flatness: 1/8 inch in 10 feet in any direction.

END OF SECTION

SECTION 09 9000
PAINTING AND COATING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Surface preparation.

B. Field application of paints, stains, varnishes, and other coatings.

C. Scope: Finish all interior and exterior surfaces exposed to view, unless fully factory-finished and unless otherwise indicated, including the following:
   1. Both sides and edges of plywood backboards for electrical and telecom equipment before installing equipment.
   2. Exposed surfaces of steel lintels and ledge angles.
   3. Mechanical and Electrical:
      a. In finished areas, paint all insulated and exposed pipes, conduit and fittings, boxes, insulated and exposed ducts, hangers, brackets, collars and supports, mechanical equipment, and electrical equipment, unless otherwise indicated.
      b. In finished areas, paint shop-primed items.
      c. On the roof and outdoors, paint all equipment that is exposed to weather or to view, including that which is factory-finished.
      d. Paint dampers exposed behind louvers to match face panels.

D. Do Not Paint or Finish the Following Items:
   1. Items fully factory-finished unless specifically so indicated; materials and products having factory-applied primers are not considered factory finished.
   2. Items indicated to receive other finishes.
   3. Items indicated to remain unfinished.
   4. Fire rating labels, equipment serial number and capacity labels, and operating parts of equipment.
   5. Stainless steel, anodized aluminum, bronze, terne, and lead items.
   6. Floors, unless specifically so indicated.
   7. Brick, architectural concrete, cast stone, integrally colored plaster and stucco.
   8. Glass.
   9. Concealed pipes, ducts, and conduits.

1.02 RELATED REQUIREMENTS

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

B. Section 01 7800 - Closeout Submittals.

C. Section 05 2100 - Steel Joist Framing: Shop-primed items.

D. Section 05 3100 - Steel Deck: Shop-primed items.

E. Section 05 5000 - Metal Fabrications: Shop-primed items.

F. Section 08 1113 - Hollow Metal Doors and Frames: Shop-primed items.

1.03 SUBMITTALS

A. See General and Supplementary General Conditions for submittal procedures.

B. Product Data: Provide data on all paint materials specified. Identify each material by the manufacturer's catalog number and general classification; cross-reference the specified coating, finish system, and application. Include label analysis and instructions for handling, storage, and application of each material proposed for use.

C. Selection Samples: Submit manufacturer's complete set of color samples for Architect's initial selection.

D. Certification by manufacturer that products comply with Contract Documents and are compatible with applicable substrates and with each other.

E. Maintenance Data: Submit data on cleaning, touch-up, and repair of painted and coated surfaces.

F. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. Extra Paint and Coatings: 1 gallon of each color; store where directed.
   2. Label each container with color in addition to the manufacturer's label.

1.04 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to site in manufacturer's original sealed and labeled containers; inspect to verify acceptability.

B. Container Label: Include manufacturer's name, type of paint, brand name, lot number, brand code, coverage, surface preparation, drying time, cleanup requirements, color designation, and instructions for mixing and reducing.

C. Paint Materials: Store at minimum ambient temperature of 45 degrees F and a maximum of 90 degrees F, in ventilated area, and as required by manufacturer's instructions.

1.05 FIELD CONDITIONS

A. Do not apply materials when surface and ambient temperatures are outside the temperature ranges required by the paint product manufacturer.

B. Follow manufacturer's recommended procedures for producing best results, including testing of substrates, moisture in substrates, and humidity and temperature limitations.

C. Do not apply exterior coatings during rain or snow, or when relative humidity is outside the humidity ranges required by the paint product manufacturer.

D. Minimum Application Temperatures for Latex Paints: 45 degrees F for interiors; 50 degrees F for exterior; unless required otherwise by manufacturer's instructions.

E. Provide lighting level of 80 ft candles measured mid-height at substrate surface.

PART 2 PRODUCTS

2.01 PAINTS AND COATINGS - GENERAL

A. Paints and Coatings: Ready mixed, unless intended to be a field-catalyzed coating.
   1. Provide paints and coatings of a soft paste consistency, capable of being readily and uniformly dispersed to a homogeneous coating, with good flow and brushing properties, and capable of drying or curing free of streaks or sags.
   2. Provide materials that are compatible with one another and the substrates indicated under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.
   3. Provide the manufacturer's best-quality trade sale paint material of the various coating types specified.
   4. Supply each coating material in quantity required to complete entire project in a single production run.
   5. Do not reduce, thin, or dilute coatings or add materials to coatings unless such procedure is specifically described in manufacturer's product instructions.

B. Colors: To be selected from manufacturer's full range of available colors.
   1. Selection to be made by Architect after award of contract.
   2. Match colors indicated by reference to the manufacturer's standard colors.
   3. In finished areas, finish pipes, ducts, conduit, and equipment the same color as the wall/ceiling they are mounted on/under.

2.02 PAINT SYSTEMS - EXTERIOR

A. Ferrous Metals, Primed, Alkyd, 2 Coat:
   1. Touch-up with rust-inhibitive primer recommended by top coat manufacturer.
   2. Gloss: Two coats of alkyd enamel.
      a. AkzoNobel: Devguard 4308 Alkyd Gloss Enamel.
      b. Benjamin Moore: C133 Impervo Alkyd High Gloss Enamel.
      c. Sherwin Williams: Pro Industrial Acrylic.

B. Galvanized Metals, Alkyd, 3 Coat:
   1. One coat galvanized primer.
      a. AkzoNobel: Devguard 4160 Multipurpose Tank & Structural Primer.
      b. Benjamin Moore: C163 IronClad Alkyd Low Luster Enamel.
      c. Sherwin Williams: Pro Industrial Pro-Cryl Universal Primer.
   2. Gloss: Two coats of alkyd enamel.
      a. AkzoNobel: Devguard 4308 Alkyd Gloss Enamel.
      b. Benjamin Moore: C133 Impervo Alkyd High Gloss Enamel.
      c. Sherwin Williams: Pro Industrial Acrylic.

2.03 PAINT SYSTEMS - INTERIOR

A. Concrete Masonry Units, Opaque, Latex, 3 Coat:
   1. One coat of block filler.
      a. AkzoNobel: ICI Prep & Prime 3010 Block Filler.
      b. Benjamin Moore: 160 Super Spec Latex Block Filler.
      c. Sherwin Williams: Prep Rite Block Filler.
   2. Semi-gloss: Two coats of latex enamel.
      a. AkzoNobel: Dulux Lifemaster 9200 Latex Semi-Gloss Enamel.
      b. Benjamin Moore: Waterborne Satin Impervo Low Lustre Enamel.
      c. Sherwin Williams: ProMar 200 Interior Semi-Gloss Latex.

B. Ferrous Metals, Unprimed, Latex, 3 Coat:
   1. One coat of latex primer.
      a. AkzoNobel: Devflex 4020 Flat Water-Based Acrylic Primer.
      b. Benjamin Moore: C363 IronClad Latex Low Luster Enamel.
      c. Sherwin Williams: Pro Industrial Pro-Cryl Universal Primer.
   2. Gloss: Two coats of latex enamel.
      a. AkzoNobel: Devflex 4208 Quick-Dry Waterbourne Gloss Enamel.
      b. Benjamin Moore: 309 Impervex Latex High Gloss Enamel.
      c. Sherwin Williams: Pro Industrial 0 VOC Gloss Acrylic.

C. Ferrous Metals, Primed, Latex, 2 Coat:
   1. Touch-up with latex primer.
   2. Gloss: Two coats of latex enamel.
      a. AkzoNobel: Devflex 4208 Quick-Dry Waterbourne Gloss Enamel.
      b. Benjamin Moore: 309 Impervex Latex High Gloss Enamel.
      c. Sherwin Williams: Pro Industrial 0 VOC Acrylic Gloss.

D. Galvanized Metals, Latex, 3 Coat:
   1. One coat galvanized primer.
      a. AkzoNobel: Devflex 4020 Flat Water-Based Acrylic Primer.
      b. Benjamin Moore: C363 IronClad Latex Low Luster Enamel.
      c. Sherwin Williams: Pro Industrial Pro-Cryl Universal Primer.
   2. Gloss: Two coats of latex enamel; .
      a. AkzoNobel: Devflex 4208 Quick-Dry Waterbourne Gloss Enamel.
      b. Benjamin Moore: 309 Impervex Latex High Gloss Enamel.
      c. Sherwin Williams: Pro Industrial 0 VOC Acrylic Gloss.

E. Gypsum Board/Plaster, Latex-Acrylic, 3 Coat: Typical walls.
   1. One coat of alkyd primer sealer.
      a. AkzoNobel: ICI Prep & Prime LM9116 Odorless Water-Based Primer/Sealer.
      b. Benjamin Moore: UltraSpec 500 Interior Latex Primer.
      c. Sherwin Williams: ProMar 200 Zero VOC Interior Latex Primer.
   2. Eggshell: Two coats of latex-acrylic enamel.
      a. AkzoNobel: Dulux Lifemaster 9300 Eggshell Interior Latex Enamel.
      b. Benjamin Moore: UltraSpec 500 Interior Latex Eggshell Finish.
      c. Sherwin Williams: B20 ProMar 200 Zero VOC Interior Latex Eg-Shel.

2.04 ACCESSORY MATERIALS

A. Accessory Materials: Provide all primers, sealers, cleaning agents, cleaning cloths, sanding materials, and clean-up materials required to achieve the finishes specified whether specifically indicated or not; commercial quality.

B. Patching Material: Latex filler.

C. Fastener Head Cover Material: Latex filler.

PART 3 EXECUTION

3.01 EXAMINATION

A. Do not begin application of coatings until substrates have been properly prepared.

B. Verify that surfaces are ready to receive work as instructed by the product manufacturer.

C. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially affect proper application.

D. Test shop-applied primer for compatibility with subsequent cover materials.

E. Measure moisture content of surfaces using an electronic moisture meter. Do not apply finishes unless moisture content of surfaces are below the following maximums:
   1. Gypsum Wallboard: 12 percent.
   2. Masonry, Concrete, and Concrete Unit Masonry: 12 percent.

3.02 PREPARATION

A. Clean surfaces thoroughly and correct defects prior to coating application.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

C. Remove or repair existing coatings that exhibit surface defects.

D. Remove surface appurtenances, including electrical plates, hardware, light fixture trim, escutcheons, and fittings, prior to preparing surfaces or finishing.

E. Seal surfaces that might cause bleed through or staining of topcoat.

F. Materials Preparation: Carefully mix and prepare paint materials according to manufacturer's directions.
   1. Maintain containers used in mixing and applying paint in a clean condition, free of foreign materials and residue.
   2. Stir material before application to produce a mixture of uniform density; stir as required during application. Do not stir surface film into material. Remove film and, if necessary, strain material before using.
   3. Use only thinners approved by the paint manufacturer and only as recommended.

G. Provide barrier coats over incompatible primers or remove and reprime.

H. Concrete and Unit Masonry Surfaces to be Painted: Remove dirt, loose mortar, scale, salt or alkali powder, and other foreign matter. Remove oil and grease with a solution of tri-sodium phosphate; rinse well and allow to dry. Remove stains caused by weathering of corroding metals with a solution of sodium metasilicate after thoroughly wetting with water. Allow to dry.

I. Gypsum Board Surfaces to be Painted: Fill minor defects with filler compound. Spot prime defects after repair.

J. Galvanized Surfaces to be Painted: Remove surface contamination and oils and wash with solvent. Apply coat of etching primer.

K. Corroded, Painted & Unpainted Steel and Iron Surfaces to be Painted: Prepare using at least SSPC-PC 2 (hand tool cleaning) or SSPC-SP 3 (power tool cleaning) followed by SSPC-SP 1 (solvent cleaning). Remove grease, mill scale, weld splatter, dirt, and rust. Where heavy coatings of scale are evident, remove by hand or power tool wire brushing or sandblasting; clean by washing with solvent. Apply a treatment of phosphoric acid solution, ensuring weld joints, bolts, and nuts are similarly cleaned. Prime paint entire surface; spot prime after repairs.

L. Shop-Primed Steel Surfaces to be Finish Painted: Sand and scrape to remove loose primer and rust. Feather edges to make touch-up patches inconspicuous. Clean surfaces with solvent. Prime bare steel surfaces. Re-prime entire shop-primed item.

M. Metal Doors to be Painted: Prime metal door top, side and bottom edge surfaces.

3.03 APPLICATION

A. Remove unfinished louvers, grilles, covers, and access panels on mechanical and electrical components and paint separately.

B. Apply products in accordance with manufacturer's instructions, using the preparation, products, sheens, textures, and colors as indicated.
   1. Remove, refinish, or repaint work not complying with requirements.

C. Where adjacent sealant is to be painted, do not apply finish coats until sealant is applied.

D. Do not apply finishes over dirt, rust, scale, grease, moisture, scuffed surfaces, or other conditions detrimental to formation of a durable coating film.

E. Do not apply finishes to surfaces that are not dry. Allow applied coats to dry before next coat is applied.

F. Use applicators and methods best suited for substrate and type of material being applied and according to manufacturer's instructions.
   1. Brush Application: Use brushes best suited for the type of material applied; use brush of appropriate size for the surface or item being painted; produce results free of visible brush marks.
   2. Roller Application: Use rollers of carpet, velvet back, or high-pile sheep's wool as recommended by manufacturer for material and texture required.
   3. Spray Application: Use airless spray equipment with orifice size as recommended by manufacturer for material and texture required.

G. Minimum Coating Thickness: Apply paint materials no thinner than manufacturer's recommended spreading rate; provide total dry film thickness of entire system as recommended by manufacturer.
   1. Number of coats and film thickness required are the same regardless of application method.
   2. If undercoats, stains, or other conditions show through final coat of paint, apply additional coats until paint film is of uniform finish, color, and appearance.
   3. Give special attention to ensure edges, corners, crevices, welds, and exposed fasteners receive dry film thickness equivalent to that of flat surfaces.

H. Apply finish to completely cover surfaces with uniform appearance without brush marks, runs, sags, laps, ropiness, holidays, spotting, cloudiness, or other surface imperfections.
   1. Before applying finish coats, apply a prime coat of material recommended by manufacturer, unless the surface has been prime coated by others; where evidence of suction spots or unsealed areas in first coat appear, recoat primed and sealed surfaces to ensure finish coat with no burn through or other defects due to insufficient sealing.

2. Apply first coat to surface that has been cleaned, pretreated, or otherwise prepared as soon as practical after preparation and before subsequent surface deterioration.
3. Do not apply succeeding coats until the previous coat has cured as recommended by manufacturer.
4. Do not recoat until paint has dried to where it feels firm, does not deform or feel sticky under moderate thumb pressure, and application of another coat will not cause the undercoat to lift or lose adhesion.
5. Pigmented (Opaque) Finishes: Provide smooth, opaque surface of uniform finish, color, appearance, and coverage.

I. Dark Colors and Deep Clear Colors: Regardless of number of coats specified, apply as many coats as necessary for complete hide.

J. Paint surfaces behind movable equipment and furniture the same as similar exposed surfaces. Before the final installation of equipment, paint surfaces behind permanently fixed equipment or furniture with prime coat only.

K. Metal Doors to be Painted: Finish doors on tops, bottoms, and side edges same as exterior faces.

L. Reinstall electrical cover plates, hardware, light fixture trim, escutcheons, and fittings removed prior to finishing.

3.04 CLEANING

A. Collect waste material that could constitute a fire hazard, place in closed metal containers, and remove daily from site.

B. At the end of each workday, remove empty cans, rags, rubbish, and other discarded paint materials from site.

3.05 PROTECTION

A. Protect other work, whether being painted or not, against damage by painting. Correct damage by cleaning, repairing or replacing, and repainting as approved by Architect.

B. Provide "Wet Paint" signs to protect newly painted finishes. Remove temporary protective wrappings provided by others to protect their work after completing painting operations.

C. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces. Comply with procedures specified in MPI Manual.

END OF SECTION

SECTION 10 7300
PROTECTIVE COVERS AND CANOPIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Aluminum door canopies.

1.02 RELATED REQUIREMENTS

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

B. Section 01 7800 - Closeout Submittals.

C. Section 07 4213 - Metal Roof Panels: Downspouts.

D. Section 07 6200 - Sheet Metal Flashing and Trim.

E. Section 07 9000 - Joint Sealants.

1.03 DESIGN REQUIREMENTS

A. Materials, assembly and attachments to resist snow loads and positive and negative wind design loads at any point without damage or permanent set for the panel lengths required. Deflection will be limited to L/60 on roll-formed shapes.
   1. Design Snow Load: 20 lb/sq ft.
   2. Design Wind Load: 90 mph, Exposure C

1.04 SUBMITTALS

A. See General and Supplementary General Conditions for submittal procedures.

B. Product Data: Provide manufacturer’s technical data and specifications on protective coverings, attachment devices to framing system, and installation instructions.

C. Shop Drawings: Complete erection and installation drawings for door canopies and canopy systems. Include plans, transverse sections, and large-scale details showing sizes, gutter locations and drainage configurations, covering and trim details, connection attachments, anchorage, size and type of fasteners, and accessories required for installation.
   1. Shop drawings for canopy systems shall be prepared under supervision of a licensed Structural Engineer

D. Samples, Finish: Submit 2 x 2 inch samples of available finishes for selection purposes.

E. Samples, Panel: When requested, submit one sample consisting of 12 inch by 24 inch roof panel with 24 inch gutter, prefinished.

F. Manufacturer's Certificate: Certify that protective covers and canopy systems meet or exceed specified load requirements for the installed configurations.

G. Warranty: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

1.05 WARRANTY

A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.

B. Finish Warranty: Provide manufacturer’s special warranty covering failure of factory-applied exterior finish on metal roof panels and agreeing to repair or replace panels that show evidence of finish degradation, including significant fading, chalking, cracking, chipping, peeling or delamination within specified warranty period of 10 year period from date of Final Acceptance of the work or Beneficial Occupancy.

PART 2 PRODUCTS

2.01 MATERIALS

A. Aluminum Extrusions: T-6063 alloy.

B. Electrolytic Separators: 30 mil EPDM (black rubber).

C. Aluminum Finishes: Baked enamel, comply with AAMA 2603. Color to be selected from manufacturer's standard color chart.

2.02 ALUMINUM DOOR CANOPIES

A. Basis of Design: Ballews Aluminum Products.

B. Aluminum Roof Panels: Interlocking composite roof panels, aluminum laminated to core material, nominal 3 inch deep, 24 inch wide.
   1. Facing Material: .024 inch prefinished aluminum, both sides.
   2. Core: 1 pound density expanded polystyrene.

C. Perimeter Frame: Extruded prefinished aluminum fascia with integral concealed gutter, nominal 3 inches by 6 inches deep. Provide prefinished drain scuppers at each canopy.

D. Accessories: Component accessories and fasteners shall be of similar material as prime components.

E. Supports: Provide supporting frame with brackets and hanger rods as indicated on the drawings, finished to match canopy.

2.03 FABRICATION - GENERAL

A. Fit and shop assemble components in largest practical sizes, for delivery to site.

B. Fabricate components with joints tightly fitted and secured.

C. Exposed Fastenings: Unobtrusively located; consistent with design of component, except where specifically noted otherwise.

D. Supply components required for anchorage of framing. Fabricate anchors and related components of same material and finish as framing, except where specifically noted otherwise.

E. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.

F. Accurately form components to suit each other and to building structure.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that wall substrate anchors are acceptable and are ready to receive work.

B. Verify that surrounding area is ready for canopy installation, with adjacent concrete, masonry and roofing work complete.

3.02 PREPARATION

A. Coordinate and furnish anchorages, templates and drawings required for placement of supplemental framing members, blocking and brackets. Coordinate delivery of such items to project site.

B. Prior to beginning of installation of protective covers, inspect supporting steel provided by others for compliance with details. Notify Architect in writing of unsatisfactory conditions requiring correction.

3.03 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Install roof panels and gutters plumb and level, rigid, accurately fitted, properly aligned for positive drainage, free from distortion or defects.

C. Provide anchors required for connecting framing to structure. Anchor framing securely to structure. Erector to provide additional clips and bracing as required. Seal all penetrations to the building surface.

D. Provide continuous electrolytic separator strips between aluminum roof components and steel framing.

3.04 TOLERANCES

A. Maximum Variation From Plumb: 1/4 inch per story, non-cumulative.

B. Maximum Misalignment From True Position: 1/4 inch.

3.05 CLEANING

A. Clean roof panels and touch-up damaged finish after completion of installation using field-applied paint to match color of shop-applied finish.

END OF SECTION

SECTION 11 1313
LOADING DOCK ACCESSORIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Corner guards for sectional door openings.

B. Track guards for protection of sectional door tracks.

1.02 RELATED REQUIREMENTS

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

1.03 SUBMITTALS

A. See General and Supplementary General Conditions for submittal procedures.

B. Product Data: Indicate unit dimensions, method of anchorage, and details of construction.

C. Manufacturer's Installation Instructions: Indicate special installation requirements.

PART 2 PRODUCTS

2.01 COMPONENTS

A. Corner Guards: Molded high density polyethylene with UV inhibitors, impact resistant, designed for attachment to outside corner of masonry opening (where jamb meets exterior wall face). L-shaped in cross section. Provide one pair at each sectional door opening.
   1. Basis of Design: Corner Protectors, Absorbents Online.
   2. Inside Corner Dimensions: 4 inches by 8 inches.
   3. Outside Corner Dimensions: 6 inches by 10 inches.
   4. Height: 42 inches.
   5. Color: Safety yellow.
   6. Fasteners: Provide manufacturers standard wall anchors for attachment to masonry.

B. Track Guards: Schedule 40 steel. 1/3 inch steel sides, L-shaped in cross section with additional flange for wall attachment, welded to 1/2 inch base plate for anchorage to floor. Provide one pair at each sectional door opening.
   1. Basis of Design: Overhead Door Track Guard, Global Industrial.
   2. Baseplate Dimensions: 10 inches by 10 inches.
   3. Height: 48 inches.
   4. Color: Safety yellow.
   5. Fasteners: Provide manufacturers standard wall anchors for attachment to masonry wall, concrete slab.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that anchor placement is acceptable.

3.02 INSTALLATION

A. Install corner guards and track guards in accordance with manufacturer's instructions.

END OF SECTION